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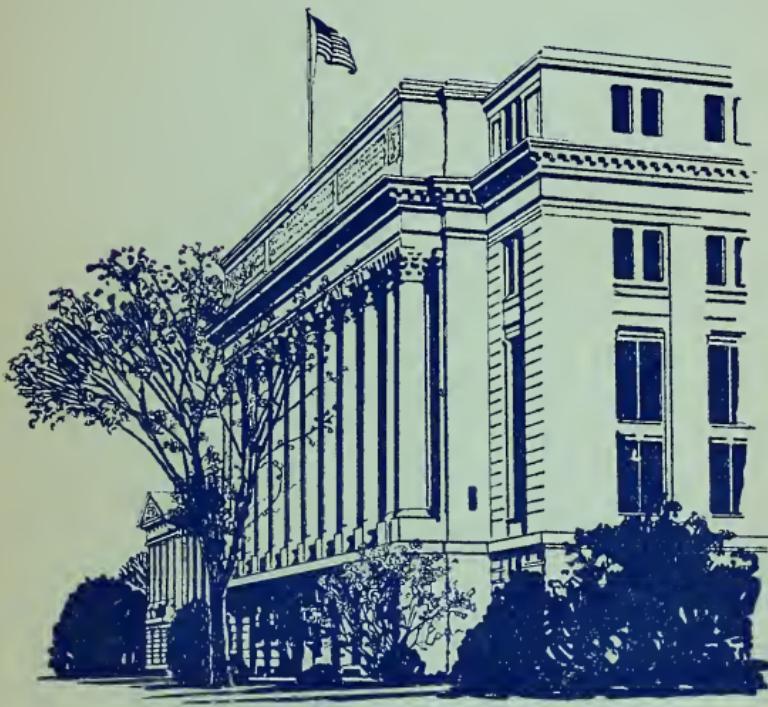
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THE UNITED STATES
DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

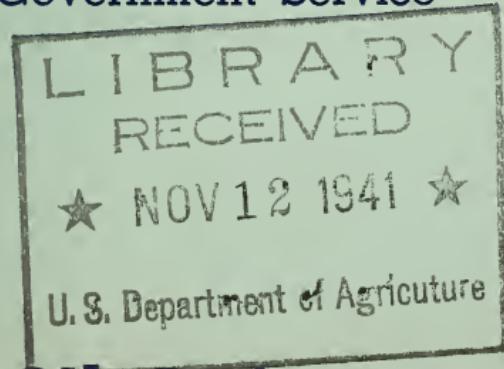
Washington



First Semester, 1941-42

BULLETIN OF COURSES

Making Facilities Available for
Study and Research in the
Government Service



1921—**20th Anniversary—1941**

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CHARLES E. KELLOGG, Ph.D. (Department of Physical Sciences) Chief, Division of Soil Survey, Bureau of Plant Industry

FRANCIS J. SETTE, M.S. (Department of Engineering and Mechanical Arts) Deputy Administrator, Rural Electrification Administration

HOWARD P. BARSS, M.S. (Department of Biological Sciences) Principal Botanist and Experiment Station Administrator, Office of Experiment Stations

LEON O. WOLCOTT, Ph.B., LL.B. (Department of Public Administration) Special Assistant, Surplus Marketing Administration

JAMES F. GRADY, A.B. (Department of Office Skills) Correspondence Counselor, Office of Personnel

Business Office—Room 1031, South Building

Telephone—Extension 5943,

Department of Agriculture

DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

GENERAL INFORMATION

Origin and Authority. This is the twentieth anniversary of the establishment of the Graduate School. Facilities for study and research in the government departments are made available by Congressional authority to qualified individuals, students, and graduates of institutions of learning in the several states and the District of Columbia under such rules and restrictions as the heads of departments and bureaus may prescribe (Joint Res. April 12, 1892, 27 Stat. 395; Deficiency Act of March 3, 1901, 31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act of the Department, the Graduate School was organized in 1921 with the approval and encouragement of the Secretary of Agriculture.

Objectives. 1. To provide graduate education acceptable in graduate institutions for the convenience of employees who desire advanced degrees but find it difficult, both for personal and official reasons, to complete all study in residence at the degree-granting institution.

2. To supplement in-service training programs conducted on government time and at government expense, by making it possible for employees to train themselves both intensively and extensively for proficiency in their present positions and for advancement to better positions.

3. To provide certain cultural, creative, and leisure-time opportunities for employees.

4. To assure the attainment of these objectives by making available to employees the experience, knowledge, and instructional talent of outstanding specialists in the federal service.

Administration. The School is a self-supporting, non-profit institution. It receives no federal funds. Its government is vested in the General Administration Board, appointed by the Secretary of Agriculture. Its administration is vested in the Director, appointed by the Board, and a small administrative staff. These have the advisory assistance of the Director Emeritus and Educational Adviser and eight committees named by the Board, one for each of the major divisions of the School. Members of the Board and of the committees serve without compensation.

Faculty. Graduate School instructors are drawn almost entirely from the federal service, a source of talent and expertness probably unequaled anywhere else in the nation. Faculty members combine excellent academic training, college teaching experience, and daily practice in the application of the subject-matter taught. For a brief note about each instructor, turn to the back of this booklet.

Library Facilities. The Department of Agriculture Library, containing approximately half a million books, is open to Graduate School students from 8:00 a.m. to 8:00 p.m.

Library Assistantships. A limited number of library assistantships are open to qualified students from the Department of Agriculture who wish to use this method of paying their fees. All work is done after official hours. Students interested should inquire at the School Office.

Lectures and Publications. Each semester the School sponsors one or more lecture series in which nationally known authorities participate. Topics for this semester will be announced later. Several of these lectures, and a few other scholarly works, are available as Graduate School publications. (See back cover.)

REGISTRATION AND FEES

First Semester Begins September 22, 1941

Registration. Register early. Avoid late registration congestion. Register in Room 1031, South Building, Department of Agriculture, before the semester opens on September 22.

Late Registration Fee. Students who register after October 5 must pay an additional fee of \$1.00 a course. This does not apply to courses which begin after October 5, nor to persons who submit written evidence that official government action prevented their registration prior to that date.

Fees. The fee for each course is indicated in the course description. Unless otherwise stated, fees are computed at the rate of \$6.00 a credit hour for undergraduate courses marked I, II, and III and \$7.00 a credit hour for graduate and the most advanced undergraduate courses, marked IV and V. These fees, unlike those in previous years, cover credit as well as non-credit charges. Official certification of the student's record in the Graduate School will be issued upon payment of 50 cents for each copy.

Partial Payment Plan. Arrangements may be made at the time of registration for paying in two installments, for which there will be an additional service charge of \$1.00 for each course. The first installment of not less than half the full fee, plus the \$1.00 service charge, must be paid at the time of registration. The second and final installment must be paid on or before November 3. Failure to pay will result in automatic suspension from class.

Refunds. Students withdrawing from classes will not be entitled to refunds, except that—

1. When an announced course is not given for want of a sufficient number of students, the fee will be returned in full.
2. When a student is OFFICIALLY transferred out of the Washington area, or is otherwise by official action entirely prevented from attending class, his fees will be refunded in the amount proportionate to the unexpired portion of the semester, provided written evidence of such transfer or action is presented. This does not apply to cases arising out of the student's voluntary action.
3. When a student is granted permission to withdraw from a class during the first two weeks of the course, his fee, minus a \$3 registration charge, will be refunded.

Refunds are made on no other basis. All adjustments are made as of the date on which application for refund is received.

Room Assignments. Room assignments for classes may be obtained from the School Office after September 15 or from the Graduate School bulletin board outside Room 1031, South Building.

CREDIT AND CERTIFICATION

Academic Credit. Credits are accepted by the Civil Service Commission to fulfill college educational qualifications for taking Civil Service examinations. Courses are of college grade for the levels indicated, with the exception of a few non-credit courses given to meet special training needs of federal employees, and credit for the work is accepted by many leading colleges and universities when it meets the requirements of the program selected by the students. Because of the exceptional conditions under which the School operates, it has seemed neither necessary nor desirable to educators within and outside the government that the School be included on the lists of accrediting associations.

Planning Your Program. Students who want credit certified to a college or university should, whenever possible, arrange their programs with the institution to which credits are to be sent. Graduate programs should be arranged in advance through the dean of the graduate school of the institution from which the degree is contemplated. The latest catalogs of colleges and universities are available for examination in the Graduate School Office. Officers of the School and instructors will be glad to assist students in selecting courses.

Certification of Student's Record. Upon the student's request, an official certification bearing the seal of the Graduate School will be sent to him or to an educational institution or other organization designated by him. The fee for this service, beginning with the academic year 1941-42, will be 50 cents a copy prepaid. (Note: Students who desire certification of work done prior to the academic year 1941-42 must comply with certification rules in effect at the time the student was enrolled.)

Cooperation with American University. The Graduate School and the Graduate Division of the School of Social Sciences and Public Affairs of the American University have found it mutually advantageous to cooperate in certain portions of their graduate programs. Certain courses in each school which supplement courses in the other are offered cooperatively. Graduate School students who take such courses (those starred) are eligible for residence credit at American University.

Transcripts. Any student working for academic credit should secure from the schools attended a transcript of his academic work and file it with the Secretary of the Graduate School, Eva M. Johnson. Students who enroll in courses given in cooperation with American University and desire credit at American must file a transcript with that institution and otherwise comply with its rules.

HOURS OF CLASS MEETING

The system of staggered hours of employees in the various federal departments and agencies has made it impossible to schedule classes to meet the needs and convenience of all prospective students. In continuing its practice of beginning late afternoon classes at 5 o'clock, the School has attempted to make its classes available to a maximum number of federal employees without serious inconvenience to Agriculture employees, who are officially dismissed at 3:45 o'clock.

All class hours may be modified, however, if the class members can agree upon a preferred hour when the class first convenes.

"Without question the most elaborate and most successful in-service training institution is the Graduate School of the Department of Agriculture. . . . The high standards of instruction and the breadth of training afforded by the Graduate School mark it as one of the foremost training institutions of its kind in the world."—Leonard D. White, Professor of Public Administration, University of Chicago, and former member of the Civil Service Commission. (By permission of Professor White and the Macmillan Company.)

DESCRIPTION OF COURSES

Explanation

Roman numerals following course titles indicate college year levels—e.g., Economics of Imperfect Competition (V, 3 cr.) means a fifth-year or graduate course carrying three credits.

The asterisk (*) preceding a course title indicates cooperation with American University.

Many, but not all, courses not scheduled this semester are listed only by title and date when next to be offered. All courses which are fully described are available during the first semester.

DEPARTMENT OF BIOLOGICAL SCIENCES

Departmental Committee

HOWARD P. BARSS, M.S., Principal Botanist and Experiment Station Administrator, Office of Experiment Stations (Chairman)

P. N. ANNAND, Ph.D., Assistant Chief, Bureau of Entomology and Plant Quarantine

M. A. McCALL, Ph.D., Assistant Chief, Bureau of Plant Industry

H. L. SHANTZ, Ph.D., Chief, Division of Wildlife Management, Forest Service

BENJAMIN SCHWARTZ, Ph.D., Chief, Zoological Division, Bureau of Animal Industry

Undergraduate

SYSTEMATIC BOTANY (II, 2 cr. each sem.)—Dr. S. F. Blake; Mon. and Wed. 5 to 6 beginning Sept. 22. \$12.

This course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

Graduate and Advanced Undergraduate

PRINCIPLES OF PLANT ECOLOGY (III, 2 cr. each sem.)—Dr. C. H. Muller; Wed. and Fri. 5 to 6 beginning Oct. 1. \$12.

The fundamentals of the relationship between natural habitat factors and natural vegetation. An analysis of habitat factors and their determination will precede a study of plant indicators, competition, succession, climax, and similar phenomena. These are the bases of the study of plant communities in the second semester.

Prerequisite: Consent of instructor.

ADVANCED PLANT ECOLOGY (IV, V, 2 cr. each sem.)—Dr. M. B. Waite; 1942-43.

LAND MANAGEMENT ECOLOGY (III, 3 cr.)—Dr. Edward H. Graham; Tues. and Thurs. 5 to 6:30 beginning Oct. 21. \$18.

A course in the application of ecological principles to major types of land use. Emphasis will be placed upon those fundamentals of both plant and animal ecology which apply to the management of land resources such as soil, crops, forests, range, and wildlife. The course is especially designed for those without extensive biological training who are interested in forestry, range management, wildlife management, and soil conservation and wish to obtain an ecological approach to the techniques of land management.

USEFUL PLANTS OF THE AMERICAN TROPICS (III, 3 cr.)—Dr. F. R. Fosberg; Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$18.

An introductory course designed to acquaint the student with some of the plants of interest in Tropical America. Previous botanical training or experience in the American Tropics is not required. The aim of this course is to give the student a better comprehension of the relation of tropical plants to the economy of the people of Tropical America and to our own national welfare, special emphasis being placed on those plants the production of which is essential as a supplement to our own agriculture.

PLANT PHYSIOLOGY (IV, V, 2 cr. each sem.)—Dr. Glenn A. Greathouse; Thurs. 5 to 7 beginning Sept. 25. \$14.

A course for advanced students and investigators interested in the fundamental and practical applications of plant physiology. The discussions will include the methods used to solve particular types of problems. The importance of modern physics and chemistry to

plant research will be reviewed and elaborated. A general outline of the proposed course may be secured from the Graduate School office.

Prerequisite: General knowledge of botany, chemistry, and physics.

PLANT BIOPHYSICS (IV, V, 2 cr. each sem.)—Dr. Glenn A. Greathouse; 1942-43.

DISEASES OF WILDLIFE (IV, V, 2 cr.)—Dr. J. E. Shillinger; Mon. 5 to 7 beginning Sept. 29. \$14.

This course embraces a general survey and description of the more prominent diseases affecting wildlife, including fur animals and game birds raised on game farms. The relationship of these wildlife diseases to human health and to livestock losses will be given consideration as well as their significance in economic conservation.

Prerequisite: Bachelor's degree with major in biology or equivalent.

MEDICAL AND VETERINARY ENTOMOLOGY (IV, V, 2 cr.)—Dr. F. C. Bishopp; Tues. 5 to 7 beginning Sept. 23. \$14.

A timely general course in medical entomology with emphasis on the practical aspects of this important field. The biology, habits, and relation to disease of insects, spiders, mites, and ticks, will be discussed. The way in which these arthropods affect man and animals as intermediate hosts, or carriers of disease-producing organisms, will be given attention and special consideration given to methods of control. The adaptation of known control procedures to present-day defense problems will be considered. Features of the course will include lectures by some of the outstanding specialists in this general field and round-table discussions of practical problems.

Prerequisite: Basic training in biology or consent of instructor.

INTRODUCTION TO PATHOLOGY (III, IV, 2 cr.)—Dr. W. W. Bennett; Wed. 5 to 7 beginning Sept. 24. \$12.

Instruction by means of lectures and demonstrations on the fundamental processes involved in diseases of man and animals. The underlying principles of infection and immunity will also be considered.

Prerequisite: A course in animal histology, unless waived by the instructor.

DEPARTMENT OF PHYSICAL SCIENCES

Departmental Committee

CHARLES E. KELLOGG, Ph.D., Chief, Division of Soil Survey, Bureau of Plant Industry (Chairman)

ARNOLD K. BALLS, Ph.D., Head Chemist, Bureau of Agricultural Chemistry and Engineering

LELA E. BOOHER, Ph.D., Chief, Foods and Nutrition Division, Bureau of Home Economics

C. G. ROSSBY, D.Sc., Assistant Chief, Weather Bureau, Department of Commerce

GEORGE W. TRAYER, C.E., Chief, Division of Forest Products, Forest Service

ASTRONOMY

PRACTICAL ASTRONOMY (III, IV, 2 cr. each sem.)—A. Hughlett Mason; Tues. 5 to 7 beginning Sept. 23. \$12.

Astronomical systems of coordinates; determination and conversion of time; secular and periodic changes; corrections to observations; use of the transit and sextant; determination of latitude, longitude and azimuth. This course is intended for students interested in celestial navigation, higher surveying, or geodesy.

CHEMISTRY

Undergraduate

GENERAL INORGANIC CHEMISTRY (non-credit)—Dr. E. P. Clark; Mon. 5 to 7 beginning Sept. 29. \$12.

Designed for students whose work is not in the chemical field but who desire a general knowledge of the subject as an aid in reading and understanding other subjects in which chemistry plays a minor role. The course will consist of lectures, amply demonstrated, covering the atomic and molecular theory; valence; the gas laws; and a general consideration of the elements. After the completion of the foregoing material a brief introduction to the system employed in quantitative analysis will be presented.

INTRODUCTION TO ORGANIC CHEMISTRY (II, 2 cr. each sem.)—
Dr. E. P. Clark; Thurs. 5 to 7 beginning Oct. 2. \$12.

The fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; the second semester to the aromatic and heterocyclic series.

Graduate and Advanced Undergraduate

PHYSICAL CHEMISTRY (III, 2 cr. each sem.)—Dr. Walter J. Hamer;
Tues. 5 to 7 beginning Sept. 30. \$12.

Classification of matter; atomic and kinetic theories; atomic and molecular structure; solutions; the phase rule; chemical kinetics; thermochemistry and thermodynamics; flame and explosive temperatures; photochemistry; radioactive chemical changes; electrochemistry; conduction by electrolytes.

ADVANCED ORGANIC CHEMISTRY (IV, 2 cr. each sem.)—C. Verne Bowen; Tues. 5 to 7 beginning Sept. 30. \$14.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic and aromatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins, and sex hormones will be given.

Prerequisites: One year general chemistry; one year organic.

PHYSIOLOGICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. Herbert O. Calvery; Wed. 5 to 7 beginning Oct. 1. \$14.

A lecture course on the principles of biochemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e.g., muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; the digestion and absorption of the principal foodstuffs; metabolism of the proteins, fats, and carbohydrates; mineral metabolism; the chemical constituents of the urine; and finally a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

Prerequisites: One year general chemistry; one year organic.

QUANTITATIVE MICRO-ORGANIC ANALYSIS (III, IV, 1 cr.)—Dr. E. P. Clark; at Belisville; second semester.

GLASS BLOWING (See ENGINEERING AND MECHANICAL ARTS).

GEOGRAPHY AND GEOLOGY

Graduate and Advanced Undergraduate

PHYSIOGRAPHY OF THE UNITED STATES (III, IV, 2 cr.)—Dr. Otto E. Guthe; second semester.

INTRODUCTION TO METHODS OF QUANTITATIVE GEOGRAPHY (IV, V, 2 cr.)—Dr. John Kerr Rose; Tues. 5 to 7 beginning Sept 30. \$14.

Several important sections of the field of geography will be surveyed, including population distribution, agricultural geography, land utilization, and climatology. The general approach will be that of the recognition and definition of problems that can be studied by quantitative technique; survey of quantitative contributions that have been made thereto. Specific application and utility of descriptive statistics, correlations, and sampling techniques. Areal indices and measures of association applied to data having spatial distribution. The statistical techniques used will be introduced and taught as needed. During the latter part of the semester the techniques studied earlier in the course will be projected into some aspects of economic and industrial geography with special attention to location theory.

OPTICAL MINERALOGY (V, 2 cr.)—Dr. Earl Ingerson; Fri. at 5 in Geophysical Laboratory beginning Sept. 26. One lecture and three laboratory hours a week; laboratory hours to be arranged. Special fee \$15.

Optical properties of minerals. The behavior of light in crystals and crystalline aggregates; determination of optical constants of crystals and determination of unknown crystals from their optical properties. Minerals will be used both as knowns and unknowns, because complete tables are available for their identification. However, the immersion method is stressed, which is equally applicable to inorganic reagents and to organic compounds.

Prerequisite: Physics and mineralogy.

MICROSCOPICAL PETROGRAPHY (V, 2 cr.)—Dr. Earl Ingerson; second semester.

METALLURGY

PRINCIPLES OF PHYSICAL METALLURGY (III, 2 cr.)—Dr. Victor H. Gottschalk; Wed. 7:30 to 9:30 beginning Oct. 1. \$12.

Development, meaning, and use of equilibrium diagrams for binary alloys. The iron-carbon diagrams and their relation to cast iron and steel, and to the critical points important in heat-treating ferrous alloys. Steel-treating processes depending on non-equilibrium conditions, including the S-curve. The alloy steels. Aging and precipitation hardening. Segregation and other ingot defects. Mechanical and physical tests, including the interpretation of micrographs. Non-ferrous alloys of industrial importance.

ADVANCED PHYSICAL METALLURGY (IV, V, 2 cr.)—Dr. Blake M. Loring; second semester.

METEOROLOGY

Graduate and Advanced Undergraduate

DESCRIPTIVE METEOROLOGY (III, IV, 2 cr.)—Benarthur C. Haynes, assisted by specialists; Thurs. 5 to 7 at Weather Bureau, beginning Sept. 25. \$12.

One semester devoted to a general treatment of atmospheric processes with special emphasis on methods of air mass analysis and their application to synoptic charts of the surface and upper-air and to forecasting. The course is intended to be of an introductory nature, but those without some familiarity with meteorology will be at a disadvantage.

SYNOPTIC WEATHER MAP ANALYSIS (IV, V, 2 cr. each sem.)—Benarthur C. Haynes; Tues. 5 to 7 in room 45, Weather Bureau, beginning Sept. 30. \$14 and laboratory fee of \$2.

A laboratory course open to not more than twelve students. The first semester covers practice in the analysis of synoptic charts of the surface and an introduction into upper-air analysis. The second semester will be a continuation of surface analysis with added emphasis on various upper-air charts and the application of modern forecasting methods.

FORECASTING ANALYSIS (IV, 2 cr.)—Benarthur C. Haynes; second semester.

CLIMATOLOGY (III, IV, 2 cr.)—Dr. C. Warren Thornthwaite and David Blumenstock; second semester.

PHYSICS

Graduate

ANALYTICAL MECHANICS (V, 2 cr. each sem.)—Dr. Richard K. Cook; Tues. and Thurs. 5 to 6 beginning Sept. 30. \$14. (For complete description, see MATHEMATICS.)

THERMODYNAMICS (IV, V, 2 cr. each sem.)—Dr. F. G. Brickwedde; 1942-43.

SOIL SCIENCE

Undergraduate

SOIL CONSERVATION (II, 2 cr.)—Dr. Jay A. Bonsteel; Mon., Wed., and Fri. 5 to 6 beginning Sept. 29. \$12.

A guidance course intended to give a broad, general view of the physical aspects of soil conservation problems and a basic outline of the extent and the causes of soil erosion and the methods employed for its prevention; a summary of the research, planning, operations, and progress of soil conservation in the main physical and agricultural regions of the United States.

Graduate and Advanced Undergraduate

SOIL FERTILITY (III, IV, 3 cr.)—J. K. Ableiter; Wed. and Fri. 4:30 to 6 beginning Sept. 24. \$18.

The factors that determine the fertility of the soil and its response to fertilization, liming, green manuring, and other practices are developed. Attention is given to the determination of fertilizer needs and the use of fertilizers in relation to soil conditions, crops grown, and the development of a management system on the individual farm. The properties and use of commercial fertilizer materials and mixtures are discussed.

SOILS: THEIR MORPHOLOGY, GENESIS, AND CLASSIFICATION (IV, V, 3 cr.)—Dr. Charles E. Kellogg; second semester.

SOILS AND PLANNING—SEMINAR (V, 1 cr.)—Dr. Charles E. Kellogg; second semester.

DEPARTMENT OF MATHEMATICS AND STATISTICS

Departmental Committee

W. EDWARDS DEMING, Ph.D., Mathematical Adviser, Bureau of the Census (Chairman)
LOUIS BEAN, M.B.A., Head Agricultural Economist, Bureau of Agricultural Economics
W. F. CALLANDER, LL.B., Chief, Division of Agricultural Statistics, Agricultural Marketing Service
B. R. STAUBER, M.A., In Charge, Land Policy-Credit Coordination, Office of Land Use Coordination
O. C. STINE, Ph.D., Chief, Division of Statistical and Historical Research, Bureau of Agricultural Economics

(Unless specifically stated, one-semester courses will not be repeated in the second semester.)

MATHEMATICS

Undergraduate

PRACTICAL ARITHMETIC—Albert J. Mattern; Thurs. 5 to 7 beginning Sept. 25. \$12.

Short-cut methods and checking procedures. Computing percentages, ratios, decimal equivalents, interest and discount, loan repayment schedules. Specific problems brought in by members of the class are treated. This is not a credit course but is intended to improve performance in accounting, statistical, and secretarial work.

No prerequisites.

1. ALGEBRA (I, 3 cr.)—Harry J. Winslow; Tues. and Thurs. 5 to 6:45 with an intermission, beginning Sept. 23. \$18.

The fundamental rules of algebra; exponents; logarithms; proportion, manipulation with proportions; identities and conditions; solution of equations; binomial theorem, numerical approximations. Symbols of operations. Determinants; solution of equations by the reciprocal matrix. Some theory of equations. Progressions; series. Permutations and combinations. Graphical methods.

Prerequisites: High school algebra, plane and solid geometry.

2. TRIGONOMETRY AND ANALYTIC GEOMETRY (I, 3 cr.)—Harry J. Winslow; second semester.

3. 4. CALCULUS (II, 3 cr. each sem.)—Dr. C. Winston; Mon. and Wed. 5 to 7 beginning Sept. 29. Offered in alternate years. \$18.

First semester: Variables, functions, limits, continuity, divided differences, derivatives. Application of the derivative to geometry, physics, curve fitting, and analysis. Mean value theorem. The antiderivative. Riemann integration.

Second semester: Standard integral forms. Partial and total derivatives. Constrained maxima and minima in functions of two variables. Lagrange multipliers. Interpolation. Taylor's series with one or more independent variables. Propagation of errors. Operations with series. Multiple integrals. Line integrals. Approximate integration; the Euler-Maclaurin formula; mechanical integration. Function scales. History and application stressed.

Prerequisites: Mathematics 1 and 2.

Graduate and Advanced Undergraduate

American University will grant residence credit for any course listed below.

5. HIGHER ALGEBRA (IV, 3 cr.)—Dr. E. J. Finan; Wed. and Fri. 5 to 6:30 beginning Sept. 24. Offered in alternate years. (A continuation of this course into the second semester may be arranged after the class convenes.) \$18.

Miscellaneous equations; proportion and manipulation; mathematical induction, multinomial theorem; inequalities; undetermined coefficients; determinants, theory of equations, some matrix algebra; root-squaring processes. History. The student will have an opportunity to learn something about mathematical rigor. Text: Hall and Knight *Higher Algebra* (Macmillan).

Prerequisites: Two semesters of college mathematics (courses 1 and 2).

8. COORDINATE GEOMETRY AND VECTORS (IV, 2 cr.)—Dr. S. B. Littauer; offered next semester and in alternate years.

9. NOMOGRAMS (IV, 1 cr.)—Eugene Rasor; Fri. 7 to 8 beginning Sept. 26. Offered every three years. \$7.

A course in the construction of nomograms. It will commence with a review of analytic geometry and the necessary algebra. Charts

will be constructed for applications in statistics, engineering, and actuarial work.

Prerequisites: Mathematics 1 and 2.

12. INTERPOLATION (V)—Dr. W. Edwards Deming; offered every fourth year; due in 1942-43.

13. MATHEMATICS OF INVESTMENT (V)—Offered every third year; due in 1942-43.

15, 16. ADVANCED CALCULUS (IV, V)—Offered every fourth year; due next year.

17, 18. DIFFERENTIAL EQUATIONS (V)—Offered in alternate years; due next year.

19, 20. LINEAR ALGEBRA (V)—M. A. Girshick; offered every third year; due in 1943-44.

21, 22. THEORY OF INFINITE PROCESSES (V)—Dr. C. Winston; offered every fourth year; due in 1942-43.

23, 24. THEORY OF FUNCTIONS (V)—Dr. C. Winston; offered every fourth year; due in 1944-45.

25, 26. ANALYTICAL MECHANICS (V, 2 cr. each sem.)—Dr. Richard K. Cook; Tues. and Thurs. 5 to 6 beginning Sept. 30. Offered in alternate years. \$14.

The course begins with a study of vector algebra, after which the study of statics and dynamics is taken up in vector notation. Potential theory, mechanics of systems of particles and of rigid bodies, vibrating systems, rotating systems, the principle of least action, Hamilton's principle, relativity kinematics and dynamics. Similarities between the equations of mechanics and those of other fields of physics will be pointed out. Topics of special interest to the class will be taken up if time permits.

Prerequisites: Calculus; college physics and a first course in statics and dynamics.

27, 28. SELECTED TOPICS IN THE HISTORY AND PHILOSOPHY OF MATHEMATICS (V, 2 cr. each sem.)—Prof. Tobias Dantzig; Wed. 7 to 9 beginning Oct. 1. Offered in alternate years. \$14.

The first half of this course was given in the fall of 1940-41, and the second half is now offered. The classical approach to non-Euclidean geometry, from Saccheri to Lobachevsky. The differential-geometric approach: Gauss, Lie, Riemann, Beltrami. The projective approach: Russell, Hilbert, Veblen.

Prerequisites: Mathematics 3 and 4.

29. INTERPOLATION, APPROXIMATION, AND MECHANICAL QUADRATURE (V)—Prof. J. Shohat; offered every four years; due in 1942-43.

31, 32. STATISTICAL MECHANICS (V)—Dr. F. G. Brickwedde; offered every three years; due in 1942-43.

STATISTICS

Prefatory Note

Most if not all problems of inference from data in agriculture are not and can not be made purely statistical, but must involve close attention to the scientific aspects. There is no such thing as being trained in statistics without being trained also in some branch of science and in philosophy. In conjunction with the courses in statistics, the student is earnestly urged to pursue studies in these lines of thought; such work constitutes an intangible prerequisite to progress in statistical inference. Moreover, any course, statistical or otherwise, necessarily receives its character from the instructor, wherefore students planning to undertake work in statistics are advised to look forward to a well-rounded program, not to be curtailed until a number of points of view have been acquired. Mathematics in various degrees, both as a tool and as a mode of thought, is indispensable to studies in statistics, and it is a rule that students working for credit in any course must come prepared with the stated mathematical prerequisites. The Director and members of the staff will be glad to assist students in drawing up programs of study.

OUTSIDE LECTURES. The Graduate School has made a practice of bringing one or two outside leaders in statistical thinking to Washington annually. In the past, the following eminent authorities have lectured here: R. A. Fisher, John Wishart, Walter A. Shewhart, J. Neyman, Frank Yates, Harold Hotelling, and Harold Jeffreys. Some of these lectures are available in print; see the list of publications at the back.

SEMINARS IN STATISTICAL INFERENCE—Meetings are held approximately semi-monthly under the direction of Dr. W. Edwards Deming. This is not a credit course, and no fee is charged; registration, however, is required. Applications should be sent in writing to the Director. Notices regarding meetings are mailed to those who register.

Undergraduate

1. GRAPHIC METHODS FOR PRESENTING STATISTICAL DATA (II, 2 cr.)—R. G. Hainsworth; Tues. and Thurs. 5 to 7 beginning Sept. 23. \$12.

Application of various classes, forms, and types of illustrations. Actual working examples in time series charts, frequency diagrams, graphic correlation charts, statistical maps, pictorial symbol charts, and other illustrative examples. Reduction, reproduction, and color application to graphic mapping and charting. Lettering, short-cut methods, and standardization rules.

Prerequisites: A first course in statistics, or experience to satisfy the instructor.

3. INTRODUCTION TO STATISTICAL ANALYSIS, 1st half.

SECTION A (I, 2-3 cr.)—Dr. O. A. Pope; Mon. 5 to 7 beginning November 10 and ending in March. \$12 for 2 cr. \$18 for 3 cr.

An additional seminar will be held Thursdays at 3 o'clock for consideration of special research problems; this seminar is optional, giving one additional credit to those who complete the assignments. The course is for students of the plant and animal science who wish an introduction to experimental designs and analyses. It is non-mathematical and is designed particularly as a forerunner to Dr. Brandt's course (No. 20). The topics are randomized blocks, Latin squares, factorial designs, and pseudo-factorial designs.

There are no mathematical prerequisites.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang; Thurs. 5 to 7 beginning Sept. 25. \$12.

This is a non-mathematical elementary course designed for statistical clerks who wish to become familiar with the more common statistical terms and formulas, and who wish to learn how to lay out the forms for machine calculations. Methods of checking calculations will be emphasized. The course will include the presentation of data and the results of calculations in tables and charts.

No prerequisites.

SECTION C (II, 2 cr.)—Sidney Wilcox; Tues. and Thurs. 5 to 6 beginning Sept. 30. Offered also in the second semester by R. L. Funkhouser; Mon. 7 to 9. \$12.

Designed for students of business and economics. The collecting of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series. Attention will be given to the preparation of formulas for machine calculations.

Prerequisites: Mathematics 1 and 2.

4. INTRODUCTION TO STATISTICAL ANALYSIS, 2d half.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang; a continuation of Course 3, Section B; second semester.

SECTION C (II, 2 cr.)—R. L. Funkhouser; Mon. 7 to 9 beginning Sept. 29. Offered also in the second semester by Sidney Wilcox; Tues. and Thurs. 5 to 6. \$12.

This is a continuation of Course 3, section C. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to the analysis of variance and its relation to correlation. Introduction to statistical inference. Adaptation of formulas to machine calculation.

5. MACHINE CALCULATION (I, 1 cr.)—Donald W. Geesa; second semester.

7. STATISTICAL APPLICATIONS OF TABULATING EQUIPMENT (III, 1 cr.)—Milton Kaufman; Wed. 7 to 9 beginning Sept. 24, at the office of the I. B. M., 1111 Connecticut Avenue. Repeated in the second semester. Registration limited to 25. Fee \$9.

The punch card method. The functions of the principal machines. The instruction will cover the actual wiring of all types of I. B. M. tabulating equipment as well as the theory of their use in statistical work. The use of cards to obtain sums of squares and cross products in correlation and curve fitting will be demonstrated.

8. ADVANCED APPLICATIONS OF TABULATING EQUIPMENT (III, 1 cr.)—Milton Kaufman; Fri. 7 to 9 beginning Sept. 26, at the office of the I. B. M., 1111 Connecticut Avenue. Repeated in the second semester if the demand is sufficient. Registration limited to 25. Fee \$9.

The solution of complex problems in the application of tabulating equipment. The instruction will include the actual operation and wiring of the principal machines involved.

Prerequisite: Statistics 7, or a basic knowledge of I. B. M. tabulating equipment.

Graduate and Advanced Undergraduate

American University will grant residence credit for any course listed below, except Course 17, 18.

9. INDEX NUMBERS AND TIME SERIES (IV, 2 cr.)—C. M. Purves;
Wed. and Fri. 5 to 6 beginning Sept. 24. \$14.

The theory of index numbers, sampling, and methods of weighting various types of index numbers. Analysis of index numbers of prices, production and trade statistics. The analysis of time series includes a review of the methods of measuring the components of the series, and the application of these methods to specific problems.

Prerequisites: Statistics 3 and 4.

10. CORRELATION ANALYSIS (IV, 2 cr.)—C. M. Purves; second semester.

11, 12. GRAPHIC CORRELATION (IV)—Louis Bean; offered in alternate years; due in 1942-43.

13, 14. AGRICULTURAL STATISTICS (IV, 2 cr. each sem.)—Dr. F. M. Wadley; Fri. 4:30 to 6:30 beginning Sept. 26. \$14.

A nonmathematical course in the interpretation of data. Consideration for theory and previous experience, to ascertain whether and what predictions can be made regarding future data, and of actually making whatever prediction seems allowable. Testing for stability of data. Frequency distributions; the multiple histogram. Ideal sampling conditions; actual conditions. Some ideal sampling theory; single sample, several samples. The necessity for examining data in rational subgroups. Statistical stability. Scatter diagrams. Experimental design. Planning for required levels of precision. Complex experiments. Applications to economics, entomology, chemistry, toxicology, agronomy, horticulture, animal experimentation. Students' problems discussed.

Prerequisites: Mathematics 1 and 2; Statistics 3 and 4.

16. THEORY OF PROBABILITY (IV)—M. A. Girshick; offered every three years; due in 1942-43.

17, 18. ELEMENTARY STATISTICAL METHODS IN BIOLOGY AND AGRICULTURE (non-credit, correspondence course for field workers)—Dr. F. M. Wadley. Work may be commenced at any time unless the class is full; registration limited. Special fee \$15.

This course uses Snedecor's textbook **Statistical Methods**, and follows its outline largely but not absolutely. Each of the 15 lessons consists of a discussion, a textbook assignment, questions and problems. The reports are returned with corrections and comments. Subjects discussed include simple variation, regression and correlation, analysis of variance and covariance, chi-square, multiple and curvilinear correlation, applications to sampling and experimental design. Practical application of methods is kept to the front. Facility in the use of arithmetic and simple algebra is necessary. Information furnished on application.

Graduate

American University will grant residence credit for any course listed below.

20. STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (V, 2-3 cr.)—Dr. A. E. Brandt; Tues. 7 to 9 beginning Nov. 18 and ending in March. \$14 for 2 cr. \$21 for 3 cr.

The design of experiments, and the statistical analysis of the observations. The concept of independent comparisons or individual degrees of freedom. Randomized blocks, Latin squares, factorial and pseudo-factorial designs; confounding and partial confounding. A seminar supplementing the lectures will be held on Fridays at 3 o'clock at which specific problems of interest to class members will be discussed. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisite: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified. Course 3, section A, is designed as a forerunner to this course.

21, 22. THE INTERPRETATION OF STATISTICAL CALCULATIONS (V, 2 cr. each sem.)—Alexander Sturges; Mon. 5 to 7 beginning Sept. 29. \$14.

First semester: The philosophy and assumptions involved in statistical inference from sampling data. The conditions of sampling will be stated and compared with practical situations. The effect of failure to meet the ideal conditions will be studied. Methods will be offered for deciding whether the sampling conditions depart too far from the ideal.

Second semester: The selection and use of statistical tests. The illustrative problems will deal with single and multiple attributes. Time series will be discussed in the light of some new methods.

Prerequisites: Statistics 3 and 4, Mathematics 1 and 2.

23. *CENSUS STATISTICAL METHODS (V, 3 cr.)—Dr. Philip M. Hauser and Morris H. Hansen; Thurs. 5:15 to 7:45 beginning Sept. 25, in room 510 at American University, 1905 F St. Audit \$24. Credit \$30.

Schedule design, definitions, field methods, editing and tabulating procedures, and the pre-publication analysis of census data. Lectures will be supplemented by a syllabus of census schedules, instructions, tabulation forms, and other materials relating to each major census inquiry, and by special discussion groups on particular censuses. The decennial census of population, including data on families, occupations, and unemployment, the census of agriculture, the census of manufactures, the census of business, and special institutional censuses and vital statistics.

Prerequisites: Elementary and intermediate courses in statistics, or their equivalent.

24. *STATISTICAL FIELD STUDIES (V, 3 cr.)—Dr. Howard B. Myers, assisted by M. Starr Northrop; second semester.

25, 26. *LABOR STATISTICS (V, 3 cr. each sem.)—Dr. Jacob Perlman; Thurs. 7:50 to 10:20 beginning Sept. 25, in room 110 at American University, 1905 F St. Audit \$24. Credit \$30.

A description and critical analysis of sources of statistical data used in the field of labor economics and of the methods used in their collection, analysis and presentation. The first semester gives a description and analysis of statistics of labor force, occupational descriptions and classification, industrial classification, statistics of the census of manufactures, statistics on employment and pay rolls, estimates of employment and unemployment, and analysis of wage structure in American industry. The second semester presents a description and an analysis of statistics of annual earnings and labor income, labor productivity, retail prices and cost of living, real wages, labor turnover, age in industry, methods of wage payment, vacations with pay, union scales of wages and hours of labor, trade union membership, collective agreements, and industrial disputes.

Prerequisites: Elementary and intermediate courses in statistics, or their equivalent.

28. POPULATION STATISTICS (V, 2 cr.)—Dr. Philip M. Hauser; second semester.

29, 30. ADJUSTMENT OF OBSERVATIONS (V)—Dr. W. Edwards Deming; offered every three years; due in 1943-44.

31. METHODS OF QUALITY CONTROL (V, 3 cr.)—Dr. W. Edwards Deming, assisted by Major Leslie Simon; Thurs. 7 to 10 beginning Sept. 25. Offered every three years. \$21.

A course in modern statistical inference, nonmathematical. Some review of error theory. Statistical stability and randomness; Shewhart's criteria. Samples as evidence for prediction. Different kinds of prediction; discussion of various statistical methods and their limitations. The Shewhart control chart. Rational subgroups. Keynes' contributions. Runs. The importance of order. The judgment of control. Attaining and maintaining control. Sample inspection. The interpretation of sample data in the light of theory and previous experience. The value of carryover in experience. Applications to industrial problems and government control processes. Practices recommended by the American Standards Association and the British Standards Institute. Texts: Shewhart, *Quality Control and Statistical Method from the Viewpoint of Quality Control*; Simon, *Engineers' Manual of Statistical Methods*.

Prerequisites: Mathematics 1 and 2; calculus advised; elementary and intermediate courses in statistics.

32. LEAST SQUARES (V)—Dr. W. Edwards Deming; offered next semester and every third year.

33, 34. THEORY OF SAMPLING (V)—Jerome Cornfield and W. D. Evans; offered in alternate years; due in 1942-43.

35. SAMPLING METHODS IN SOCIAL AND ECONOMIC SURVEYS (V, 3 cr.)—J. Stevens Stock and Lester R. Frankel; Tues. 5:15 to 8:15 beginning Sept. 30. \$21.

Actual applications of the representative method to practical and timely problems. Fallacies of the total count. Accuracy and precision. Problems involved in the selection of a sample. The theory of random sampling. The choice of sampling unit. Subsampling, stratified sampling, purposive selection. The use of intraclass correlation and analysis of variance in the design of sampling techniques. Analysis of cost data. Review of important sampling procedures as used in the United States and foreign countries.

Prerequisites: Statistics 3 and 4, or equivalent. Knowledge of calculus helpful but not necessary.

37, 38. THEORY OF SAMPLE SURVEYS (V, 2 cr. each sem.)—Dr. William G. Madow and William Hurwitz; Wed. 7 to 9 beginning Sept. 24. Offered in alternate years. \$14.

History of some previous sampling surveys. The types of prediction made possible by sampling to estimate characteristics of a finite set of data, and sampling to estimate characteristics of the population of which the finite set of data is a sample. The uses of

statistical control in improving the quality and efficiency of the estimates. Random, stratified random, purposive, double, and systematic sampling. Cost function, choice of sampling unit, size and type of samples necessary to attain a stated degree of precision, and the distinction between precision and accuracy. The theory of probability will be developed as necessary. The contributions of Fisher, Neyman, Yates, Cochran, and others will be studied.

Prerequisites: Mathematics 3 and 4; Statistics 3 and 4.

39, 40. STATISTICAL METHODS FOR RESEARCH WORKERS (V)—
Dr. William G. Madow; offered every three years; due in 1942-43.

41, 42. MULTIVARIATE ANALYSIS (V, 2 cr. each sem.)—M. A. Girshick; Mon. 5 to 7 beginning Sept. 29. Offered every three years. \$14.

Function theory is reviewed as necessary. Some theorems on probability; theorems on mean value. Moment generating functions; the characteristic function. Multivariate normal distribution; joint moments of sample variances, and covariances. Sampling from a bivariate normal population. Tests of significance; problems of estimation. Joint distribution of variance and covariance; distribution of the correlation coefficient when the population correlation is and is not zero. Least squares; classical applications; relation to maximum likelihood. Distribution of the multiple correlation coefficient. Orthogonal polynomials. Factor analysis. Canonical correlation. Non-normal distributions. Applications.

Prerequisites: A course in advanced statistics. Mathematics 3 and 4, 19 and 20, or 5.

43, 44. THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION (V, 2 cr. each sem.)—Dr. Solomon Kullback; Fri. 7:30 to 9:30 beginning Sept. 26. Offered every three years. \$14.

Set functions, monotone functions, Stieltjes integrals. Random variables. The Fourier integral. Harmonic analysis. Characteristic function; moment generating properties; inversion formula, continuity property. Limit theorems. Distribution theorem for functions of random variables. Applications.

Prerequisites: Mathematics 15 and 16, or 23 and 24, and elementary and intermediate courses in statistics.

45, 46. MODERN STATISTICAL THEORIES (V, 2 cr. each sem.)—
Dr. Joseph F. Daly; Tues. 8 to 10 beginning Sept. 30. Offered in alternate years. \$14.

First semester: Review of some fundamental principles of probability, calculus and statistical theory. Sample space. Regions of rejection. Tests of hypotheses. Likelihood ratio tests and their power functions.

Second semester: A study of papers by Neyman, Pearson, Wilks, etc. Relation of the likelihood ratio to the analysis of variance. The theory of estimation. Limitations of modern statistical tools. The necessity for studying data in rational subgroups. The contributions of Shewhart and Keynes.

Prerequisites: Mathematics 3 and 4; elementary and intermediate courses in statistics.

DEPARTMENT OF ECONOMICS AND SOCIAL SCIENCES

Departmental Committee

CHARLES F. SARLE, Ph.D., Executive Assistant for Scientific Services, Weather Bureau, Department of Commerce; formerly Director, Division of Economics, Commodity Credit Corporation (Chairman)

T. G. STITTS, Ph.D., Chief, Cooperative Research and Service Division, Farm Credit Administration

CARL C. TAYLOR, Ph.D., Chief, Division of Farm Population and Rural Welfare, Bureau of Agricultural Economics

M. L. WILSON, D.Sc., Director, Extension Service, and former Under Secretary of Agriculture

The chairman of the departmental committee, officers of the School, and members of the teaching staff will be glad to assist students in planning programs of study in this department. For prerequisites in these courses consult the instructor.

ECONOMICS

Undergraduate

1, 2. PRINCIPLES OF ECONOMICS (III, 3 cr. each sem.)—Dr. F. L. Thomsen; Tues. and Thurs. 5 to 6:30 beginning Sept. 23. \$18.

An examination of the nature, validity, and significance of the "fundamental principles of economics." Designed to give the student the understanding of basic concepts necessary for advanced

study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. What we know and do not know about the nature and causes of business cycles. International economic relations. Political economic "isms." Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

3. **COTTON CLASSING (II, 2 cr.)**—R. L. Kause, in cooperation with the Cotton Division, AMS; 1942-43.

Graduate and Advanced Undergraduate

4. 5. ***ECONOMIC THEORY (IV, 3 cr. each sem.)**—Dr. Howard S. Piquet. See A.U. catalog, Econ. 401-402. Thurs. 7:50 to 10:20. Class in Agriculture Building. Audit \$24. Credit \$30.

This course is designed to aid in meeting the requirements of candidates for the Master's degree in economics. It follows in general outline the more advanced presentation in Contemporary Economic Thought. It is open to those who as undergraduates have had adequate preparation in economics.

6. 7. **HISTORY OF ECONOMIC THOUGHT (IV, 3 cr. each sem.)**—Dr. Max J. Wasserman; Mon. and Wed. 5 to 6:30 beginning Sept. 22. \$21.

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices which conditioned them.

Prerequisite: Consent of the instructor.

8. ***SEMINAR: THE ECONOMIES OF THE NATIONS OF LATIN AMERICA (IV, V, 4 cr.)**—Dr. Charles F. Sarle; Tues. and Thurs. 5 to 7, beginning Sept. 30. \$28.

This course is designed to develop an understanding of the economic life, resources, and trade of the countries of Latin America, and the relationships of the economies of these nations among themselves, with the United States, Europe, and Asia. Emphasis will be placed on constructive programs to contribute to economic solidarity of the Americas. Especially qualified lecturers will discuss specific problems. Each student will be expected to select at least one major problem for intensive study and present occasional reports to the seminar.

9. ***AGRICULTURAL ECONOMICS (IV, V, 3 cr.)**—Dr. O. C. Stine; second semester.

10. ***LAND ECONOMICS (IV, V, 2 cr.)**—Dr. M. M. Kelso, Dr. V. Webster Johnson, and specialists of the Division of Land Economics; Tues. 5 to 7 beginning Sept. 30. \$14.

A survey of the economic principles governing the utilization of major land types, including an appraisal of present land resources and future need for various types of land and land uses, traditional practices and customs that affect land use, private and public land ownership and tenancy relationships, problems of new settlement, land income under different conditions of ownership and management, and of various state and local measures for the direction and control of land use and occupancy.

11. ***SEMINAR IN LAND ECONOMICS RESEARCH (IV, V, 2 cr.)**—Dr. M. M. Kelso, Dr. V. Webster Johnson, and specialists of the Division of Land Economics; second semester.

*FARM LABOR PROBLEMS (See SOCIOLOGY)

FARM TENANCY (See SOCIOLOGY)

12. **RESEARCH METHODS IN THE SOCIAL SCIENCES (IV, V, 1 cr.)**—Dr. Michael T. Wermel; Mon. 5:30 to 6:30 beginning Sept. 29. \$7.

A thorough review of the principles of scientific method will be followed by lectures and discussions of the proper techniques to be used in applying these principles to the social sciences and particularly to economics. This course will include a survey of the principles of critical scholarship which appear to be most generally acceptable.

13. ***ORGANIZED LABOR AND THE LAW (IV, V, 3 cr.)**—Dr. David Ziskind; Mon. 7:30 to 10 beginning Sept. 22. \$21.

This course is designed to develop an understanding of the functioning of law and government agencies in the field of labor relations. It will present an analysis of court actions and judicial decisions on the organization of trade unions, the incidents of union membership, collective bargaining, strikes and lockouts, picketing, boycotts, blacklists, conciliation and arbitration, and trade union responsibility.

14. ***THE INDIVIDUAL WORKER AND THE LAW (IV, V, 3 cr.)**—Dr. David Ziskind; second semester.

15. ***LABOR AND THE DEFENSE PROGRAM** (IV, V, 3 cr.)—Dr. David Ziskind; Wed. 7:30 to 10 beginning Oct. 1. \$21.
A study of the adjustments made in labor relations and labor standards during the last war and the present emergency. Special attention will be given employment services, dilution of skills, apprentice training, women in industry, overtime hours, wage changes, trade union participation in government, strikes, sabotage, conciliation, and arbitration.

16. ***WAGE AND HOUR REGULATION** (IV, V, 3 cr.)—Dr. David Ziskind; second semester.

17. ***MONEY AND BANKING** (IV, 3 cr.)—Dr. Fritz Karl Mann. See A. U. catalog, Econ. 410. Tues. 5:15 to 7:45. Audit \$24. Credit \$30.

18. ***PUBLIC FINANCE AND TAXATION** (IV, 3 cr.)—Dr. Fritz Karl Mann; See A.U. catalog, Econ. 430. Fri. 5:15 to 7:45. Audit \$24. Credit \$30.

19. ***BASIC PROBLEMS IN TRANSPORTATION AND COMMUNICATION** (IV, 3 cr.)—Dr. Ludwig Homberger. See A. U. catalog, Econ. 451. Fri. 5:15 to 7:45. Audit \$24. Credit \$30.

20. ***THE MARKET** (IV, 3 cr.)—H. W. Ketchum. See A.U. catalog, Econ. 482. Wed. 5:15 to 7:45. Audit \$24. Credit \$30.

21. ***NATIONAL RESOURCES AND NATIONAL POLICY** (IV, 3 cr.)—Dr. R. A. Clemen. See A.U. catalog, Econ. 460. Tues. 5:15 to 7:45. Audit \$24. Credit \$30.

22. ***ECONOMIC GEOGRAPHY** (IV, 3 cr.)—Dr. M. J. Proudfoot. See A.U. catalog, Econ. 467. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

To Be Offered in 1942-43

23. ***PRODUCTION ECONOMICS** (IV, V, 3 cr.)—Dr. Sherman E. Johnson and Dr. Wylie E. Goodsell.

24. ***FARM MANAGEMENT** (IV, V, 3 cr.)—Dr. Sherman E. Johnson and Dr. Wylie E. Goodsell.

25, 26. ***SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE** (IV, V, 2 cr. each sem.)—Everett E. Edwards.

27. ***ECONOMICS OF INTERNATIONAL TRADE** (IV, V, 3 cr.)—Robert B. Schwenger.

28. ***PRINCIPLES OF AGRICULTURAL FINANCE** (IV, V, 3 cr.)—Dr. Fred L. Garlock and Dr. Donald C. Horton.

29. ***PRINCIPLES OF INSURANCE** (IV, V, 3 cr.)—Dr. Allan J. Fisher.

30. ***COTTON MARKETING** (IV, V, 3 cr.)—Dr. John W. Wright and specialists.

Graduate

31, 32. ***CONTEMPORARY ECONOMIC THOUGHT** (Advanced Economic Theory) (V, 3 cr. each sem.)—Dr. Howard S. Piquet. See A.U. catalog, Econ. 501-502. Thurs. 5:15 to 7:45. Audit \$24. Credit \$30.

33, 34. ***ECONOMICS OF IMPERFECT COMPETITION** (V, 3 cr. each sem.)—Dr. Michael T. Wermel; Mon. and Wed. 7:30 to 9 beginning Sept. 29. \$21.

This course will commence with a critical reexamination of basic premises underlying the traditional theory of price determination, as an introduction to an intensive study of newer theoretical techniques, developed recently, for the analysis of prices under conditions which fit neither assumptions of "perfect competition" nor of "pure monopoly" and which have been described as conditions of "monopolistic" or "imperfect competition." In the second semester, the usefulness and applicability of this theoretical apparatus will be tested by a study of actual institutional practices, of price determination in specific markets in industries such as rubber tires, agricultural implements, drugs, meat packing, fertilizer, canning, etc., where admittedly neither "perfect competition" nor "pure monopoly" prevails.

35. ***FORECASTING DEMAND FOR AGRICULTURAL PRODUCTS** (V, 3 cr.)—Dr. F. L. Thomsen; Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$21.

An analysis of the relative importance of changes in demand and supply as affecting prices of farm products. The meaning and measurement of "demand", and of changes in demand. The influence of domestic and foreign factors responsible for changes in demand. Consumer demand and dealer demand. Demand in the cash and futures markets. The factors affecting consumer demand and consumer purchasing power. Movements of the gen-

eral price level and related conditions. Business cycles. A considerable portion of the course will be devoted to the forecasting of industrial activity and related demand conditions. Exchange rates and other factors related to export demand for United States farm products.

36. *AGRICULTURAL PRICE ANALYSIS (V, 3 cr.)—Dr. F. L. Thom-
sen; second semester.

37, 38. *THEORY AND PRINCIPLES OF AGRICULTURAL MARKET-
ING (V, 2 cr. each sem.)—Dr. F. V. Waugh, Dr. A. C. Hoffman
and R. O. Been; deferred until 1942-43.

39. *SEMINAR: ECONOMIC PROBLEMS OF THE POSTWAR WORLD
—DOMESTIC PROBLEMS (V, 3 cr.)—Dr. Mordecai Ezekiel.
Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$21.

A review of recent economic theories as they apply to the domestic problems we will face after the defense period, and to the policies we may have to adopt in dealing with those problems. Especial attention will be paid to the essential contributions of the theories which bear on under-utilization of resources and labor, including monopolistic competition and the savings-investment equilibrium; to statistical materials defining the relations objectively to the structural problems of readjustment from a defense economy to a peace-time economy; and to resulting policies in the agricultural, industrial, and fiscal fields.

40. *ECONOMIC PROBLEMS OF THE POSTWAR WORLD—INTER-
NATIONAL PROBLEMS (V, 3 cr.)—Robert B. Schwenger, Dr.
Montell Ogdon, and Dr. Mordecai Ezekiel; second semester.

41. *TRANSPORTATION AND ECONOMIC LIFE OF COUNTRY (V,
3 cr.)—Dr. Ludwig Homberger. See A.U. catalog, Econ. 552.
Thurs. 7:50 to 10:20 Audit \$24. Credit \$30.

42. *BUSINESS CYCLE THEORY (V, 3 cr.)—Dr. Fritz Karl Mann.
See A.U. catalog, Econ. 506. Wed. 5:15 to 7:45. Audit \$24.
Credit \$30.

HISTORY

Undergraduate

HISTORY OF THE UNITED STATES (I, II, 2 cr. each sem.)—Dr.
W. M. Gewehr; 1942-43.

Graduate and Advanced Undergraduate

RECENT HISTORY OF THE UNITED STATES (III, IV, 2 cr.)—Dr. W.
M. Gewehr; second semester.

WORLD POLITICS (III, IV, 2 cr.)—Dr. W. M. Gewehr; Tues. 5 to 7
beginning Sept. 30. \$12.

A survey of world affairs and international relations. Such topics will be considered as the origins of the World War of 1914-18, the Versailles Conference and the treaties that brought no peace; revolutions in Germany and Russia; the conditions that gave rise to Mussolini and Hitler; the nature of Nazism, Facism and Communism; the breakdown of the peace machinery; the war; basic issues in the Far Eastern situation; problems and prospects of Pan-Americanism; why Europe fights another war.

LATIN AMERICAN HISTORY (IV, V, 2 cr. each sem.)—Dr. Ernesto
Galarza; 1942-43.

SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE
(IV, V, 2 cr. each sem.)—Everett E. Edwards; 1942-43.

*LATIN AMERICA IN THE 19th CENTURY (IV, 3 cr.)—Dr. John C.
Patterson. See A.U. catalog, Int. Af. 451. Mon. 5:15 to 7:45.
Audit \$24. Credit \$30.

POLITICAL SCIENCE

Graduate and Advanced Undergraduate

RURAL LOCAL GOVERNMENT (III, IV, 3 cr.)—Dr. Herman Walker,
Jr.; Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$18.

The administration of public affairs in rural areas. Survey of the status, functions, organization, financing, and operation of rural political subdivisions, with special emphasis on major current problems (such as overlapping jurisdictions, state-local and federal-local relationships, the adjustment of organization to land and human resources, the responsiveness of bureaucracy to local opinion, the requirements and possibilities of effective government reorganization, the suitability of local units as instruments for carrying out social policies). Occasionally the class will be led by authorities in particular phases of local government.

LA AMERICA LATINA Y LOS ESTADOS UNIDOS (IV, V, 2 cr. each sem.)—Philip Leonard Green; Mon. 5 to 7 beginning Oct. 20. Lectures and discussions in Spanish. \$14.

This course, open to students sufficiently advanced in Spanish to follow lectures in that language, aims to provide an opportunity to achieve greater facility in Spanish while acquiring useful and interesting information on Latin America and its relations with us. The first semester deals with Latin American civilization—the factors which have influenced it and the contributions it has made in culture, science, and other spheres of human activity. The second semester covers main trends in the development of inter-American relations from colonial times to the present. It describes both official and private Pan American activities. It points out factors militating for and against inter-American amity and presents some problems and opportunities facing the Americas today.

LATIN AMERICA AND THE UNITED STATES (IV, V, 3 cr.)—Philip Leonard Green; Thurs. 7 to 10 beginning Nov. 13, ending Mar. 5. Lectures and discussions in English. \$21.

This is a concentrated orientation course designed primarily for officials of the United States Government requiring basic preparation for Latin American assignments. It describes racial, geographic, economic, political, social, and cultural considerations involved in our relations with Latin America and traces important inter-American developments from early times to and including the Good Neighbor Policy.

PUBLIC LAW

Graduate and Advanced Undergraduate

ADMINISTRATIVE LAW AND PROCEDURE (See PUBLIC ADMINISTRATION)

AGRICULTURE AND PUBLIC LAW (IV, V, 2 cr.)—Philip Glick; second semester.

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (See ACCOUNTING)

***BUSINESS LAW (IV, V, 3 cr. each sem.)**—Walter H. Young. See A.U. catalog, Econ. 483-484. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.

***ORGANIZED LABOR AND THE LAW (See ECONOMICS)**

***THE INDIVIDUAL WORKER AND THE LAW (See ECONOMICS)**

SOCIOLOGY

Graduate and Advanced Undergraduate

***THE EVOLUTION OF AMERICAN RURAL LIFE (IV, V, 3 cr.)**—Dr. Carl C. Taylor, Dr. John Provinse, and Dr. Paul Johnstone; Mon. and Wed. 5 to 6:30 beginning Sept. 22. \$21.

This course will trace the evolution of rural society in the United States from the standpoint of the characteristics, ideologies, attitudes, and opinions of the people who founded its rural society, formed its settlement patterns, and gave it its unique culture in the different regions and subregions of the country. It will take into consideration the contributions to our rural culture of type of farming, nationality and ethnic groups, social and psychological characteristics of the people, and all social and cultural factors which help to describe rural America.

***CULTURAL REGIONS OF THE UNITED STATES (IV, V, 3 cr.)**—Dr. Carl C. Taylor, Dr. John Provinse, and Dr. Paul Johnstone; second semester.

***SEMINAR IN POPULATION PROBLEMS (IV, V, 3 cr.)**—Dr. Conrad Taeuber; Mon. 7 to 10 beginning Sept. 29. \$21.

The major shifts of population within the United States, rural to urban and urban to rural. The Western movement shifts in population from South to North. Concentration of population within a few areas. The relation of population movements to economic resources and conditions.

RURAL POPULATION TRENDS IN THE UNITED STATES (IV, V, 3 cr.)—Dr. Conrad Taeuber; 1942-43.

***POPULATION PROSPECTS (IV, 3 cr.)**—Dr. Frank Lorimer. See A.U. catalog, Soc. Ec. 411. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.

***AMERICAN COMMUNITIES (IV, 3 cr.)**—Dr. Caroline Ware. See A.U. catalog, Soc. Ec. 403. Wed. 7:50 to 10:20. Audit \$24. Credit \$30.

***RURAL COMMUNITY ORGANIZATION (IV, V, 2 cr.)**—Dr. Charles P. Loomis and Dr. Douglas Ensminger; Mon. 7:30 to 9:30 beginning Sept. 22. \$14.

The role of the community in extension, action, and planning pro-

grams; the historical background of communities in the various regions of the United States and in other countries; community organization; leadership and means of developing it.

SEMINAR IN SOCIAL ORGANIZATION (V, 3 cr.)—Dr. Charles P. Loomis and Dr. Douglas Ensminger; second semester.

***SOCIAL PSYCHOLOGY (IV, V, 2 cr.)**—Dr. Raymond F. Sletto and Dr. Carl C. Taylor; Mon. 5 to 7 beginning Sept. 22. \$14.

This course will provide an analysis of beliefs, attitudes, and values as they are determined by cultural factors or are the outcomes of social roles defined in institutional patterns. Emphasis will be placed upon the interpretation of motives underlying the behavior of individuals in social situations, and upon the processes involved in the formation of personality traits. Environmental correlates of functional mental illnesses, crime, chronic alcoholism, and other forms of variant behavior will be studied, together with the social processes resulting in failure of individuals to adjust adequately to the demands made upon them.

***RURAL SOCIAL PSYCHOLOGY (V, 2-3 cr.)**—Dr. Carl C. Taylor and Dr. Raymond F. Sletto; second semester.

***CONTEMPORARY SOCIAL THEORY (IV, V, 3 cr.)**—Dr. Charles P. Loomis; Tues. and Thurs. 7 to 8:30 beginning Sept. 23. \$21.

The theories of the most important contemporary students of society will be analyzed and their contributions to the understanding of our own and other cultures appraised.

HISTORY OF SOCIAL THEORY (IV, V, 3 cr.)—Dr. Charles P. Loomis; 1942-43.

***EARLY SOCIAL THOUGHT (IV, 3 cr.)**—Dr. Ernst Correll. See A.U. catalog, Soc. Ec. 407. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

***FARM LABOR PROBLEMS (IV, V, 3 cr.)**—Dr. William T. Ham; Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$21.

This course deals with varying relationships of labor, both farm family and hired, in different type-of-farming areas, on farm enterprises of varying size, and at different times in the history of American agriculture. Factors affecting the supply of farm labor and the demand for it are analyzed, with especial attention to seasonal and migratory workers, also current tendencies affecting the position of farm laborers with reference to the "agricultural ladder." Methods of improving the status of agricultural laborers are considered.

FARM TENANCY (IV, V, 3 cr.)—Dr. William T. Ham and Marshall Harris; 1942-43.

RURAL SOCIAL PROBLEMS (IV, 3 cr.)—Olaf F. Larsen; second semester.

SOCIAL PLANNING IN AGRICULTURE (V, 3 cr.); 1942-43.

MINORITY GROUPS (V, 3 cr.); 1942-43.

***ECONOMIC AND SOCIAL PROBLEMS OF HOUSING (IV, 3 cr.)**—Dr. Karl Pribram. See A.U. catalog. Soc. Ec. 441. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.

***PRESSURE GROUPS (V, 2-3 cr.)**—Dr. Catheryn Seckler-Hudson. See A.U. catalog, P.A. 508. Mon. 5:15 to 7:45. A.U. fees.

DEPARTMENT OF PUBLIC ADMINISTRATION

Departmental Committee

LEON O. Wolcott, Ph.B., LL.B., Special Assistant, Surplus Marketing Administration, and former Assistant to Secretary Henry A. Wallace (Chairman)

JOHN R. FLEMING, B.S., Special Assistant to the Chief, Bureau of Agricultural Economics

PETER KEPLINGER, M.S.F., Staff Assistant in Administrative Management, Forest Service

VERNE B. LEWIS, B.Ed., Administrative Assistant, Office of Budget and Finance

JOHN THURSTON, Ph.D., Organization Analyst, Office of Personnel

Graduate and Advanced Undergraduate

INTRODUCTION TO PUBLIC ADMINISTRATION (III, 3 cr.)—Erwin C. Hannum; Wed. and Fri. 5 to 6:30 beginning Sept. 24. \$18.

This course is designed to introduce the student to the elements of public administration. Attention will be devoted to the evolution of administrative organization; organizational types; staff, line, and

auxiliary agencies and functions; controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; budgeting and fiscal control; federal-state relations; administrative legislation and adjudication. The object of the course is to lay a broad foundation for more intensive courses in management.

SEMINAR IN PUBLIC ADMINISTRATION (V, 2 cr.)—Leon O. Wolcott, chairman; Tues. 7:30 to 9:30 beginning Sept. 30. Limited to 30 students. \$14.

Each meeting will be devoted to a special topic or problem of particular interest to advanced students of public administration. Each subject will be presented by a person eminently qualified to discuss it.

Subjects and guest lecturers already selected are as follows: National Responsibility and Federalism, P. H. Appleby, Under Secretary of Agriculture; The Relation of Size of Organization to Management, P. H. Appleby; Should the Department of Agriculture Have a Permanent Under Secretary? W. A. Jump, Director of Finance; Congressional Committees in the United States and the Cabinet System, Hon. Clarence Cannon, Chairman, Appropriations Subcommittee on Agriculture, House of Representatives; Program Integration, M. S. Eisenhower, Land Use Coordinator; Application of Principles of Scientific Management to Governmental Agencies, Dr. H. S. Person, Consultant, Rural Electrification Administration; Social Sciences and Agricultural Administration, Dr. M. L. Wilson, Director of Extension Service; Human Factors of Personnel Administration, Roy F. Hendrickson, Director of Personnel; Administrative Planning, Donald Stone, Assistant Director, Bureau of the Budget; Long-Term Planning and Annual Budgets; Minority Interests and the General Welfare; National Maturity and Public Administration; The General's Staff; United States Department of Agriculture—Part of the National Executive.

Prerequisite: Extensive training or experience in public administration and consent of the instructor.

SCIENTIFIC MANAGEMENT (IV, V, I cr.)—Dr. Harlow S. Person; Thurs. 5 to 6 beginning Sept. 25. \$7.

A survey of the characteristics of scientific management technique as developed in various types of private enterprise, followed by an inquiry into the adaptation of this technique to the operations of various types of public enterprise. Emphasis is on organization; research and the development of standards; control through administrative and managerial planning; scheduling and progress records; supervision; budgeting.

Prerequisite: Broad training or experience in public administration or private enterprise.

ADMINISTRATIVE ORGANIZATION (IV, V, 2 cr.)—Dr. Marshall Dimock; second semester.

PUBLIC ADMINISTRATION AND THE DEPARTMENT OF AGRICULTURE (III, IV, 2 cr.)—Leon O. Wolcott; second semester.

ADMINISTRATIVE LAW AND PROCEDURE (IV, V, 2 cr.)—Dr. Ashley Sellers; Wed. 5 to 7 beginning Oct. 1. \$14.

This course will deal, in a manner less intensively and technically than courses of this nature usually are taught in the law schools, with the following: Disposition, delegation, and sub-delegation of governmental powers; limitations upon administrative discretion; regulatory procedures (including hearings) of Federal administrative agencies in general and of the Department of Agriculture in particular; recent and current proposals for revision of Federal administrative procedure; and judicial review of administrative action.

AGRICULTURE AND PUBLIC LAW (IV, V, 2 cr.)—Philip Glick; second semester.

PUBLIC OPINION AND ADMINISTRATION (IV, 2 cr.)—John R. Fleming; second semester.

FEDERAL-STATE COLLABORATION—1942-43.

PRINCIPLES OF SUPERVISION (IV, 2 cr.)—Henry H. Farquhar and specialists; Fri. 5 to 7 beginning Sept. 26. \$14.

This course covers the importance, the principles, and the practices of sound supervision. Emphasis is placed upon the various ways in which supervisory relationships may be arranged, with the consequent ease or difficulty of establishing clear lines of authority and of fixing individual accountability; the tangible and the intangible factors in leadership and morale building; supervisory control through personalized, operating budgets and executive reports; guidance, training; the adjustment of grievances and use of employee suggestions; planning work and dividing it up into specific jobs; making efficiency ratings and other measurements of employees and their work; and similar every-day aspects of the supervisor's duties. The course is conducted largely through round table discussion; for this purpose each student is expected to turn in several of his own personal supervisory problems which, after reworking and disguising, are distributed for solution or comment by students with summary and conclusion by the instructor.

PERSONNEL ADMINISTRATION

Graduate and Advanced Undergraduate

PERSONNEL ADMINISTRATION (III, IV, 2 cr.)—Maxwell A. DeVoe; Mon. 5 to 7 beginning Sept. 22. \$12.

This course will deal with the personnel problems which arise when people are associated together in a work situation. It will be designed to acquaint the student with the basic personnel policies and practices which have been found necessary and useful in coping with these problems. Trends in public personnel administration and its relationship to over-all management will be discussed. The course will be helpful to supervisors and administrators who desire a broad understanding of personnel administration and also to students who need foundation for the more specialized courses in the personnel field.

SEMINAR IN PERSONNEL ADMINISTRATION (IV, V, 2 cr.)—Roy F. Hendrickson; second semester.

POSITION CLASSIFICATION (IV, 2 cr.)—Robert S. Hare and Stanley T. Orear. \$14.

Section I—Robert S. Hare; Fri. 5 to 7 beginning Sept. 26.

Section II—Stanley T. Orear; Wed. 5 to 7 beginning Sept. 24.

INDICATE SECTION WHEN REGISTERING.

This is an introductory course designed to give the student an understanding of the fundamental concepts of position classification and its uses; the relation of classification to compensation and other phases of personnel administration; the historical background of position classification in the Federal Service; an analysis of the Classification Act of 1923 and its amendments and its relation to other personnel processes; position analysis and factors to be considered in the allocation of positions.

ADVANCED POSITION CLASSIFICATION (IV, V, 2 cr.)—James L. Buckley; Mon. 5 to 7 beginning Sept. 22. \$14.

A detailed study of federal position classification based primarily on specific cases. Emphasis will be placed on factors that enter into the allocation of positions and the application of such factors in actual and hypothetical classification situations.

Prerequisite: Position Classification or equivalent.

***COUNSELING GOVERNMENT EMPLOYEES (IV, 3 cr.)—Samuel S. Board; Tues. 5 to 8 beginning Sept. 23. \$21.**

A course designed to meet the need of personnel officers and supervisors who find themselves faced with the task of helping employees make decisions regarding their work, education, recreation, and personal problems. The techniques of interviewing for counselling purposes, sources of information, and typical problems will be given special attention.

SELECTION AND PLACEMENT (IV, 3 cr.)—Samuel S. Board; second semester.

FINANCIAL ADMINISTRATION

Graduate and Advanced Undergraduate

BUDGETARY AND FINANCIAL ADMINISTRATION: BUDGET FORMULATION (IV, V, 2 cr.)—W. A. Jump and other specialists; Thurs. 5 to 7 beginning Sept. 25. \$14.

This is the first part of an advanced, two-semester course covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureau and department budget offices, and other budgetary and financial organizations will lecture and lead discussions.

The following committee will assist Mr. Jump in planning and giving the course: Gerald G. Smith, Chief, Budget and Finance Division, Soil Conservation Service; W. J. Snow, Jr., Director of Finance and Accounts, Farm Credit Administration; Edmund Stephens, Budget Officer, Bureau of Plant Industry; Henry Wold, Budget Officer, Forest Service; Richard W. Maycock, Chief, Division of Estimates and Allotments, Office of Budget and Finance; and Verne B. Lewis, Administrative Assistant, Office of Budget and Finance.

The first semester deals with the pre-appropriation phases of budgeting including formulation, review, and Congressional enactment of the Budget. Topics to be discussed include: history, development, and purposes of budgeting in the United States and other countries; federal budgetary and fiscal policies in relation to the national economy; the role of budgeting in program formulation; the role of bureaus, departments, Bureau of the Budget, the President and Congress in budgeting; budgetary procedures; content of the Budget, the investment and capital outlay budgets;

review and analysis of budget estimates; budget justifications; legislative-administrative relationships in budgeting. Each student desiring credit will be expected to write a short paper on some problem relevant to the course.

Prerequisite: Experience in budgetary or financial administration; courses in government or public administration; or consent of instructor.

BUDGETARY AND FINANCIAL ADMINISTRATION: BUDGET EXECUTION (IV, V, 2 cr.)—W. A. Jump and specialists; second semester.

GOVERNMENTAL PURCHASING (IV, V, 2 cr.)—Samuel A. Snyder and Dr. J. B. Westcott; second semester.

PURCHASING PROCEDURE (See OFFICE SKILLS).

ACCOUNTING

Undergraduate

PRINCIPLES OF ACCOUNTING (II, 3 cr. each sem.)—William H. Rowe, Dr. Oswald Nielsen, Dr. Allan J. Fisher, Dr. V. W. Bennett, and G. Y. Jarvis. \$18. A two-hour LABORATORY PERIOD once a week is required unless specially excused by the instructor.

First semester work. Tues. and Thurs. 5 to 6 beginning Sept. 23. Laboratory, Tues., 6 to 8 beginning Sept. 30. If enough persons register for two sections, the second section will be given Mon. and Wed. at 5 beginning Sept. 22. Laboratory Mon. 6 to 8 beginning Sept. 29.

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to devise the accounting methods necessary for a small business organization, make the necessary entries in the records, draw up statements at the end of the fiscal year, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester work. Tues. and Thurs. 5 to 6 beginning Sept. 23. Laboratory, Tues. 6 to 8 beginning Sept. 30. This course will not be given during the fall semester unless 15 or more students register.

Continuation of first semester covering the more advanced principles of accounting; account classifications; the valuation of assets and depreciation policies; manufacturing accounts; partnership accounts; and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

Graduate and Advanced Undergraduate

SECOND YEAR ACCOUNTING (III, 3 cr. each sem.)—Dr. Oswald Nielsen; Fri. 5 to 8 beginning Sept. 26. \$18.

Valuation, asset values, liabilities and net worth, allocation of income, and expense to proper fiscal period as part of problem of valuation, deferring expenses and treatment of unusual losses and gains, profits and dividends and the relationship of funds to reserves.

Prerequisite: First year accounting or equivalent.

GOVERNMENTAL ACCOUNTING, second semester.

AUDITING PROCEDURE (See OFFICE SKILLS).

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (V, 2 cr. each sem.)—Dr. Mark S. Massel; Thurs. 5 to 7 beginning Sept. 25. \$14.

This course is designed to present significant accounting concepts in the field of legal problems. It will include a general exposition of accounting methods in correlation with pertinent legislation, administrative rulings, and case material. The purposive character of accounting will be treated in terms of: balance sheets, assets, liabilities, capital, income, profit and loss statements, reserves, and deferred assets. The various types of accounts will be analyzed as problems in accounting methods and in various legal fields such as stockholders' suits, income bonds, patent suits, income taxes, property taxes, fraud, estates, public utility regulation and reorganizations. Differences in the interpretation of accounts in the various legal fields will be stressed.

***ELEMENTARY COST ACCOUNTING (IV, V, 3 cr.)**—Elmer G. Koch; Fri. 5:15 to 7:45. See A.U. catalog, Econ. 486. Given at American University. Audit \$24. Credit \$30.

This course includes a thorough consideration of the basic principles of cost accounting together with their practical application in the development of cost accounting procedures. By means of lectures, study of a text, and the solution of problems, the student is familiarized with accounting for materials, labor and indirect expenses; the relationship of cost accounts to the financial accounts; departmental, process, sequential, and job lot costs; and

the uses of forms more commonly utilized in cost accounting. This is a one semester course.

Prerequisite: Principles of Accounting.

***MATHEMATICS OF FINANCE (IV, V, 2-3 cr.)**—William H. Rowe; primarily for accounting students; second semester.

***BUSINESS LAW (See PUBLIC LAW).**

DEPARTMENT OF LANGUAGE AIDS

Departmental Committee

HARRY B. HUMPHREY, Ph.D., Principal Pathologist, Bureau of Plant Industry, and Editor, Phytopathology (Chairman)

J. L. APODOCA, M.B.A., Senior Agricultural Economist, Office of Foreign Agricultural Relations

M. C. MERRILL, Ph.D., Chief, Division of Publications, Office of Information

RALPH R. SHAW, M.S., Department Librarian

ENGLISH

Undergraduate

COMPOSITION AND RHETORIC (I, 2 cr.)—Dr. Susan E. Harman; Thurs. 5 to 7 beginning Oct. 2. Repeated in second semester. \$12.

Equivalent of first-quarter freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to more advanced English courses. Special attention will be given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, etc.

DESCRIPTIVE ENGLISH GRAMMAR (III, 2 cr.)—Dr. Susan E. Harman; Mon. 5 to 7 beginning Sept. 29. Repeated in the second semester. \$12.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

LITERATURE

Advanced Undergraduate

INTRODUCTION TO SPANISH AMERICAN LITERATURE (III, IV, 2 cr.)—Dr. Madaline W. Nichols; Thurs. 5 to 7 beginning Sept. 25. \$12.

The general literary history of Spanish America, with intensive study of leading literary personalities and of their works. All lectures will be in English; reading may be done either in Spanish or in English translation.

THE CLASSICS (See SPECIAL COURSES)

SPEECH

Undergraduate

FUNDAMENTALS OF SPEECH (I, 2 cr.)—Mrs. Hester Beall Provensen; Tues. 5 to 7 beginning Sept. 30. Repeated in second semester. \$12.

A course to develop in the speaker the ability to communicate his ideas readily and effectively through the study of audience analysis, distinct utterance, outlining, word usage, enrichment of vocabulary, and voice production. Ample opportunity to speak. Individual criticism.

EFFECTIVE SPEAKING (II, 2 cr.)—Mrs. Hester Beall Provensen; Thurs. 5 to 7 beginning Oct. 2. Repeated in second semester. \$12.

Clear, forceful, and convincing expression is the result of directed practice in a variety of speech situations. Hence, this course will concentrate on preparation and practice in public speaking and the speech arts. Speeches for special occasions, description, exposition, radio speaking, story telling, and training in the art of conversation. The emphasis is on practice; knowledge of speech fundamentals is presupposed.

PERSUASIVE AND ARGUMENTATIVE SPEAKING (II, 2 cr.)—Dr. C. H. McReynolds; Mon. 5 to 7 beginning Sept. 29. \$12.

The first semester will emphasize speech construction—aims in speaking, kinds of speeches, opening statements, introduction,

outlines, illustration, humor, fact, emotion; and speech delivery—poise, communication, pause, action, gesture, concentration and emphasis. Speeches and panel discussions. In the second semester, emphasis will be placed on psychology of the audience—kinds of audiences, basic desires, habit, psychological mechanics, variety. Speech construction—the brief, evidence, authority, reason, psychology. Application of these principles in speeches, round-table discussions, and parliamentary speaking.

PERSONAL DEVELOPMENT (non-credit)—Mrs. Hester Beall Provensen; Wed. 5 to 7 beginning Oct. 1. Repeated in second semester. \$12.

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, cultivation of wider range of interest, and curiosity. Actual social situations created and discussed. Conferences, guest speakers.

Advanced Undergraduate

GROUP DISCUSSION LEADERSHIP (III, 2 cr.)—A. Drummond Jones and Dr. Morris B. Storer; Mon. 5 to 7 beginning Sept. 22. \$12.

This course is designed to meet the need of those who in their professional or in their private lives have occasion to lead in round-table, panel and open conference discussion, and who want a chance for study and practice of first principles. It is a laboratory course to be built around the special interests and problems of the class members; it aims to explore the meaning and value of group discussion in a time of national and world crisis. Study and discussion will be centered on: purpose and philosophy of discussion in a democracy; place and use of discussion in program activities represented by class members; demonstration, practice, and analytical description of types of discussion procedure; study of learning psychology implied in discussion procedure; specific attention to the techniques and evaluation of group leadership.

WRITING AND EDITING

Graduate and Advanced Undergraduate

CREATIVE WRITING (III, 2 cr.)—John L. Stewart; Thurs. 5 to 7 beginning Oct. 2. \$12.

This course is designed primarily to develop the student's inclinations in literary work through guidance, example, and practice. Emphasis is laid on facility of expression, skill in the use of words, and familiarity with the current media for reaching the reading public. The course presupposes a fundamental knowledge of composition.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (IV, 3 cr.)—Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information; Mon. and Wed. 5 to 6:30 beginning Sept. 29. Registration is limited to 40 students. Offered every year in the fall semester only. \$21.

This course is intended primarily for those seeking information on the editorial technique involved in handling manuscripts after they leave the author's hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proofreading. Practical examples of editorial work will be discussed in class. Opportunity for some familiarity with the style manual of the Government Printing Office will be provided. Collateral reading will be indicated. Those desiring credit for the course will be required to pass a written examination at the end of the semester.

WRITING SPECIAL REPORTS (IV, 2 cr.)—Alfred D. Stefferud; Fri. 5 to 7:30 beginning Oct. 3. \$14.

A combination discussion-workshop course for scientific and professional employees who need assistance in preparing research reports, bulletins, and special articles. The techniques in writing will be developed out of practical problems the student confronts in the writing project he brings to class or undertakes after entering the class. Problems of grammar, sentence structure, word selection, typography, presentation, placing of manuscripts, promotion, and audience analysis will be treated as they arise. Models will be studied and original writing analyzed and criticized. During each session students will have one hour in which to work on their manuscripts and develop writing skills under supervision. Each student will be required to complete one major writing project to receive credit for the course. Projects relating to or part of official duties will be welcomed. (A more elementary course, Workshop in Letter and Report Writing, is given in the Department of Office Skills.)

BIBLIOGRAPHICAL RESEARCH: REPORT AND DIGEST WRITING
(IV, V, 1 cr.)—Miss Mary G. Lacy; Wed. 5 to 6 beginning Sept. 24. \$7.

This course is designed for scientists and other research workers who need to develop a methodology for digesting the salient literature of a subject, and for preparing bibliographies and reports in their special fields of interest. It will cover guiding principles for the definition of scope of bibliographies, the making of abstracts and annotations, the organization of the material, the presentation of the sources consulted, and the form of entry. So far as possible, the course will revolve around the students' projects for independent bibliographical research, and the final product in each case should be a contribution to knowledge in the student's field of interest, rather than a mere exercise in bibliographical method.

FOREIGN LANGUAGES

The hours of class meeting scheduled for the language courses usually represents three credits. Students who register for two credits will meet for correspondingly shorter periods.

ELEMENTARY FRENCH (I, II, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Mon. and Wed. 5 to 6:30 beginning Sept. 29. \$12 for 2 cr. \$18 for 3 cr.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced courses in French.

ADVANCED FRENCH (III, IV, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Tues. and Thurs. 5 to 6:30 beginning Oct. 2. \$12 for 2 cr. \$18 for 3 cr.

CONVERSATIONAL FRENCH (non-credit)—Miss Mary Sabarth; Wed. 5 to 7 beginning Sept. 24. \$12.

This course is designed to give facility in conversation, use of idiom, and correct pronunciation, development of vocabulary in social and business dealings. Students will meet in sections formed on the basis of background in French grammar.

ELEMENTARY GERMAN (I, II, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Mon. 5 to 8 beginning Sept. 29. \$12 for 2 cr. \$18 for 3 cr.

Instruction in elements of German grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in German.

ADVANCED AND TECHNICAL GERMAN (III, IV, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Fri. 5 to 8 beginning Oct. 3. \$12 for 2 cr. \$18 for 3 cr.

GERMAN TRANSLATION (III, IV, 1½ cr. each sem.)—Ira T. Braunschtein; Wed. 5 to 6:30 beginning Oct. 1. \$9.

Translation from German into English and English into German, including idiomatic German. The course will also be helpful to graduate students who intend to take reading examinations for advanced degrees.

FIRST SEMESTER SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds, Miss Olivia Russell, Dr. Madaline W. Nichols, and Raphael de Haro. \$12 for 2 cr. \$18 for 3 cr.

Sec. I—Mon. 5 to 8 beginning Sept. 22

Sec. II—Tues. 7 to 10 beginning Sept. 23.

Sec. III—Wed. 5 to 8 beginning Sept. 24.

Sec. IV—Rafael de Haro; Mon. 5 to 8 beginning Sept. 29 in Longfellow Building, 1201 Conn. Ave., N. W.

INDICATE CHOICE OF SECTION WHEN REGISTERING

Pronunciation, the use of idioms, building vocabulary, elements of grammar, simple conversation, and reading.

SECOND SEMESTER SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds and Raphael de Haro; Wed. 5 to 8 beginning Sept. 24. \$12 for 2 cr. \$18 for 3 cr.

Sections I and II, meeting on the same day, will be formed if registration warrants.

Section III (2 cr.)—Raphael de Haro; Fri. 5:30 to 7:30 beginning Oct. 3, in the Longfellow Building, 1201 Conn. Ave., N. W.

Continuation of first semester work. This course was formerly called Intermediate Spanish.

THIRD SEMESTER SPANISH (II, 2-3 cr.)—Miss Ruberta M. Olds; Tues. 5 to 8 beginning Sept. 23. \$12 for 2 cr. \$18 for 3 cr.

Short grammar review with practice in translations in Spanish and English, some free composition, conversation, intensive and extensive reading.

SPANISH CONVERSATION AND COMPOSITION (III, 2-3 cr. each sem.)—Edmundo Lassalle; Thurs. 5 to 8 beginning Sept. 25. \$12 for 2 cr. \$18 for 3 cr.

A course designed to develop ability to understand and to converse in idiomatic Spanish, to translate articles in newspapers and magazines, to compose and translate social letters; free composition.

Prerequisite: Two years of Spanish or equivalent.

COMMERCIAL SPANISH (III, 2 cr. each sem.)—J. L. Colom; Tues. 5 to 7 beginning Sept. 23. \$12.

A course in commercial Spanish correspondence which includes building of appropriate vocabulary by study of forms, reading, and translations of letters. Much practice using natural idiomatic expressions in both Spanish and English letters.

Prerequisite: Two years of Spanish or equivalent.

LA AMERICA LATINA Y LOS ESTADOS UNIDOS (See POLITICAL SCIENCE).

INTRODUCTION TO SPANISH AMERICAN LITERATURE (See LITERATURE).

FIRST SEMESTER PORTUGUESE (I, II, 3 cr.)—Dr. Raul D'Eca; Tues. and Thurs. 5 to 6:30 beginning Sept. 23. \$18.

The fundamentals of the language, elements of grammar, pronunciation, reading and translation of elementary materials.

SECOND SEMESTER PORTUGUESE (I, II, 3 cr.)—Dr. Raul D'Eca; Tues. and Thurs. 7 to 8:30 beginning Sept. 23. \$18.

ELEMENTARY ITALIAN (I, II, 2-3 cr. each sem.)—Dr. Nicholas G. Barbella; Tues. 5 to 8 beginning Sept. 30. \$12 for 2 cr. \$18 for 3 cr.

The fundamentals of the language, with practice in conversation. Texts: Joseph L. Russo, *Elementary Italian Grammar*; Marro, *Contemporary Italian Short Stories*.

ELEMENTARY RUSSIAN (I, II, 2-3 cr. each sem.)—George M. Sararov; Wed. 5 to 8 beginning Oct. 1. \$12 for 2 cr. \$18 for 3 cr.

The fundamentals of the language for beginning students of Russian.

DEPARTMENT OF ENGINEERING AND MECHANICAL ARTS

Departmental Committee

FRANCIS J. SETTE, M.S., Deputy Administrator, Rural Electrification Administration (Chairman)

REGINALD G. HAINSWORTH, M.A., Head, Graphic Section, Bureau of Agricultural Economics

T. W. NORCROSS, M.S., Chief, Division of Engineering, Forest Service

J. A. SCOTT, C.E., Chief, Division of Plans and Service, Bureau of Agricultural Chemistry and Engineering

ROY STRYKER, A.B., Chief, Historical Section, Division of Information, Farm Security Administration

(NOTE: The committee is making plans for several courses in addition to those listed below. Some of these may be organized in time to include in the first semester. Inquire at the School office for further information.)

ENGINEERING

Graduate and Advanced Undergraduate

NAVAL ARCHITECTURE (IV, 2 cr. each sem.)—Charles L. Wright, Jr.; Tues. 7 to 9 beginning Sept. 23. \$14.

First semester: Determination of principal dimensions of a ship; development of ship lines; displacement and stability calculations; launching.

Second semester: Trochoidal wave theory; action of ships in waves; hull form and resistance; power; propulsion; steering.

See Note at top of next page.

SHIP CONSTRUCTION (IV, 2 cr. each sem.)—Charles L. Wright, Jr.; Thurs. 7 to 9 beginning Sept. 25. \$14.

First semester: Shipyard organization; calculations of weight and strength of ships; riveted and welded construction; design of structural parts.

Second semester: Arrangement of machinery and fittings; piping, wiring, and ventilation; load line regulations, tonnage measurement, trial trips, dry docks.

(Note: Because of the interrelation of Naval Architecture and Ship Construction, it is suggested that they be taken together. Both courses use as a text; Wright's "Outline of Naval Architecture and Ship Construction", Volume I for the first semester and Volume II for the second semester.)

STRENGTH OF SHIPS (IV, V, 2 cr.)—Freeman G. Corkum; Wed. 7 to 9 beginning Sept. 24. \$14.

General design methods; longitudinal strength; transverse strength; strength of plating; bulkheads; decks and platforms; foundations; fittings; connections and attachments; rudder and rudderposts, etc.

PHYSICAL METALLURGY—(See PHYSICAL SCIENCES)

ANALYTICAL MECHANICS—(See MATHEMATICS)

GLASS BLOWING

GLASS BLOWING (2 cr. each sem.)—Leland B. Clark; Mon. and Wed. 4:30 to 6 beginning Sept. 22, in the basement of the Smithsonian Institution. Registration limited to ten students. Special fee \$18, including materials.

This is a laboratory course for technicians. Simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the soft glasses will be utilized for practice; during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

GRAPHIC PRESENTATION

Undergraduate

Architectural and Mechanical Drawing have a two-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors in the architectural and mechanical fields.

Prerequisites: Fifteen standard high school units or equivalent.

ARCHITECTURAL DRAWING (I, II, 2 cr. each sem.)—G. L. Edick; Tues. and Thurs. 7 to 9 beginning Sept. 23. Special fee \$20.

Geometrical problems, orthographic projections, lettering, architectural symbols. Residence design, working drawings, details of construction, studies of modern methods of framing, and use of building materials.

MECHANICAL DRAWING (I, II, 2 cr. each sem.)—G. L. Edick; Tues. and Thurs. 7 to 9 beginning Sept. 23. Special fee \$20.

Geometrical problems, orthographic projections, intersections and developments, lettering, and study of material symbols. Studies in machine shop practice, assembly and detail drawings, scale detail drawings from measured sketches by the student.

AIR CONDITIONING DRAFTING (II, 2 cr.)—Edgar A. Rapp; Mon. and Wed. 7 to 9 beginning Sept. 22. Special fee \$20.

This course is designed to enable draftsmen to specialize in one branch of engineering drafting. It will cover first principles of air conditioning; air conditioning machinery and equipment; sheet metal tools and sheet metal shop practice; duct and piping layouts; study of typical air conditioning layouts by tracing of drawings of actual plants; designing piping and duct work for typical plants; complete layouts of air conditioning plants developed by the student from written problems.

Prerequisite: Mechanical Drawing or equivalent.

REFRIGERATION DRAFTING (II, 2 cr.)—Edgar A. Rapp; Tues. and Thurs. 7 to 9 beginning Sept. 23. Special fee \$20.

This course is designed to enable draftsmen to specialize in one branch of engineering drafting. It will cover first principles of refrigeration; refrigeration machinery and equipment; refrigeration piping; study of typical refrigeration layouts by tracing of drawings of actual plants; designing refrigeration piping for typical plants; complete layouts of refrigeration plants developed by the student from written problems.

Prerequisite: Mechanical Drawing or equivalent.

FREEHAND DRAWING AND SKETCHING (I, II, 2 cr.)—Walter G. Cadmus; Mon. and Wed. 5 to 7 beginning Sept. 22. Special fee \$15.

A study of light and shadow, color and line. An intensive study of theory and harmony of color and composition from still life, and pictorial and outdoor sketching. The student may work with any medium such as pencil, colored pencil, charcoal, water colors, pastels, oils, etc. Each student will receive individual criticism. Open to both beginners and advanced students. Sketching only, two hours a week, on Fri. from 5 to 7; fee \$10. Note: No credit will be given to students working only on Fridays.

SHADES AND SHADOWS (I, II, 2 cr.)—Walter G. Cadmus; Mon. and Wed. 5 to 7 beginning September 22. Special fee \$15.

An intensive study of the effect of the direction of light; problems in shades and shadows with relation to architectural forms and ornament. Each student will receive individual criticism. Open to both beginners and advanced students.

PERSPECTIVE DRAWING (I, II, 2 cr.)—Walter G. Cadmus; Mon. and Wed. 5 to 7 beginning Sept. 22. Special fee \$15.

Definitions and general theory of visual rays and study of perspective projection of an object on the picture plane. Problems representing, upon a plane surface, the appearance of objects as seen from some given point of view. Each student will receive individual criticism. Open to both beginners and advanced students.

Advanced Undergraduate

LAYOUT AND APPLIED ART (IV, 2 cr.)—Paul Bissell; Tues. 5 to 7 beginning Sept. 23. \$14.

A combination discussion and laboratory course in the making of booklets, pamphlets, posters, etc., including art work, layout, lettering, typography and the use of photographs necessary in their production. Emphasis will be placed on the making of "roughs", "visuals", and "dummies", although advanced art work will be encouraged. The various methods of engraving and printing will be explained and demonstrated in class work. The class is designed to meet a growing need in the government for trained workers of this type and is for those who have some art ability and are willing to work on assignments at home between classes.

GRAPHIC METHODS FOR PRESENTING STATISTICAL DATA—(See STATISTICS).

PHOTOGRAPHY

Advanced Undergraduate

BASIC PHOTOGRAPHY (III, IV, 2 cr.)—Carl H. Hanson and other specialists; Mon. and Wed. 5 to 6 beginning Sept. 22. \$12.

The course, elementary and basic in character, will be designed to meet the needs of the amateur. Text: Air Corps Training Manual, "Basic Photography." Topics covered: elementary photographic optics, selection and use of photographic lenses, cameras and shutters, films and plates, the photography of colored objects, exposure, elementary photographic chemistry, preparing solutions, darkroom arrangement, conveniences and practices, developers and development, the technique of developing roll films, film packs and plates, the science of printing, the practice of printing, the camera in use, selection and arrangement of the subject, outdoor photography, enlarging papers, equipment and devices, how to make enlargements, finishing photographic prints, miniature camera photography, home portraiture, lighting and posing in portraiture, indoor photography, line work and copying, color photography, amateur motion picture cameras, equipment, and materials.

DEPARTMENT OF OFFICE SKILLS

Departmental Committee

JAMES F. GRADY, A.B., Correspondence Counselor, Office of Personnel (Chairman)

HENRY A. DONOVAN, Assistant Chief, Bureau of Agricultural Chemistry and Engineering

CARL E. HERRICK, A.B., Chief, Placement Section, Division of Employment, Office of Personnel

JOHN S. LUCAS, Chief, Communications Division, Office of Plant and Operations

WILLYE A. SMITH, Office of Personnel

AUDITING PROCEDURE (II, 2 cr. each sem.)—Carey G. Cruikshank; Wed. 5 to 7 beginning Sept. 24. \$12.

This course is designed to assist audit clerks in their present and prospective positions and to enable government employees working in the lower grades as clerks, typists, etc., to fit themselves for more responsible and remunerative positions. It embraces explanations of, discussions on, and practice work with all types of government vouchers and related documents. A manual is used which outlines in detail all the various procedures. During the first semester, the course covers general principles and definition of terms; use of Standard Forms involved; purchase vouchers; claims and adjustments; General Accounting Office exceptions; formal and informal contracts; relation of procurement to auditing; tax exemption; transportation vouchers; suspensions and disallowances on all types of vouchers.

PURCHASING PROCEDURE (II, 1 cr.)—Samuel A. Snyder, assisted by others from the Division of Purchase, Sales, and Traffic
Wed. 5 to 6 beginning Sept. 24. \$6.

An elementary course designed to explain methods and procedures of government purchasing. The course will cover the entire phase of procurement from the inception of the need to the receipt of the materials and payment. Topics for discussion will be: requisitions, General Schedule of Supply contracts, open market and emergency purchases, government warehouses and stores, purchase orders, vouchers, inter-bureau transfers, and purchase contracts. Ample opportunity will be afforded class members for questions and class discussion. (A more advanced course, Government Purchasing, will be offered in the Department of Public Administration in the second semester.)

COMMUNICATIONS AND RECORDS MANAGEMENT—John S. Lucas, William Muller, and James R. Roads; Tues. and Fri. 5 to 7 beginning Sept. 30 and continuing for 15 sessions. Special fee \$10.

Mail, files, and communications procedures. The course will embrace instruction and workshop practice in (1) communications, including mail handling, telegrams, messenger service; (2) records management, including planning of procedure in records units, subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material, folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment and filing materials.

ENGLISH FOR LETTERS AND REPORTS

PRACTICAL ENGLISH USAGE—Alfred D. Stefferud; Wed. 5 to 7 beginning Sept. 24. \$12.

This course will enable the student through practice to master the fundamentals of correct English. Troublesome problems of English usage, sentence structure, choice of words, style, and grammar, will be studied as aids to clear and forceful writing of letters, memoranda, and reports.

VOCABULARY BUILDING—Mrs. Sallie M. Pease; Thurs. 5 to 7 beginning Sept. 25. \$12.

A course designed to help writers and speakers to express their ideas clearly and attractively. It embraces word study and selection, diacritical markings, synonyms and antonyms, prefixes and suffixes, usage exercises, and other means of developing a broad and useful command of words.

GOVERNMENT LETTER WRITING (II, 2 cr.)—Mrs. Florence P. Marks; Tues. 5 to 7 beginning Sept. 30. Repeated in the second semester. \$12.

The writing of Government letters from the organization of subject matter to the language of the letter, paragraphing, construction of effective sentences, and correct usage. Vocabulary building. Methods for improving expression. Development and application of appraisal standards. Discussion of the problems involved in dictating and reviewing correspondence and supervising letter writers from the standpoint of the stenographer, dictator, reviewer, and supervisor.

WORKSHOP IN LETTER AND REPORT WRITING (II, 2 cr.)—Mrs. Florence P. Marks; Fri. 5 to 7 beginning Sept. 26. \$12.

Although the course will briefly review the fundamentals of effective letter writing, it is designed for persons who may know the fundamentals and now desire to learn by doing. Primary emphasis will be placed on application of this knowledge through classroom practice in writing various types of letters, including dictation, and individual consultations and general discussions. Students who desire practice in report writing will be given assignments and help in organizing and writing reports. (A more advanced course, Writing Special Reports, is given in the Department of Language Aids.)

SECRETARIAL PRACTICES

SECRETARIAL PRACTICES—George M. Terry; Tues. 5 to 7 beginning Sept. 30. Class limited to 35. Repeated in second semester. \$12.

Designed for secretaries and stenographers who seek guidance in developing their talents and abilities for broader governmental service in the secretarial field. This course will cover the basic essentials indispensable to Government secretaries and aid them in reaching definite objectives, with special emphasis on relationships between employer and secretary. Among the topics covered will be telephone technique, knowledge of office devices and their appropriate uses, elementary mailing and filing techniques, office decorum, interviews and getting a job, and meeting callers.

Prerequisite: Stenographic experience or consent of instructor.

ADVANCED SECRETARIAL PRACTICES—Mrs. Alice Coffman; Tues. 5 to 7 beginning Sept. 30. Repeated in second semester. \$12. This course will emphasize the techniques of effective performance of the non-stenographic duties and responsibilities of the secretary; the personal qualities necessary for the private secretary; the amenities of the vocation; and the relation of the principles of secretarial work to office organization. Classroom discussions will be supplemented by actual secretarial practice and guest speakers.

Prerequisite: "Secretarial Practices" or equivalent.

SHORTHAND DEVELOPMENT

GREGG, 70 to 100 WORDS—Mrs. Alice Coffman; Mon. and Wed. 5 to 6 beginning Sept. 29. Repeated in the second semester. Class limited to 25. \$12.

This course is designed for those who desire a review of theory in Gregg shorthand with dictation from 70 to 100 words a minute. Special attention will be given to the acquisition of a large vocabulary of Gregg outlines. Dictation will be graded from business letters, the Congressional Record, and legal and technical matter relevant to the work in government offices.

GREGG, 100 to 130 WORDS—Miss Clara E. Richter; Mon. and Wed. 5 to 6 beginning Sept. 29. Repeated in the second semester. \$12.

This speed, actual word count, is the equivalent of 100 to 150 words by the standard word count formerly used. This course is designed to develop speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed. Students who are primarily interested in dictation, such as stenotypists, may also enroll.

PITMAN, 70 to 100 WORDS—Dr. Louise C. Barry; Tues. and Thurs. 5 to 6 beginning Sept. 23. \$12.

A course designed for those who wish to review the principles of Pitmanic shorthand with dictation from 70 to 100 words per minute. Special emphasis will be placed on the acquisition of speed and accuracy by means of (1) the fundamental principles of phrasing, as determined by grammatical construction and Pitmanic theory; (2) the use of brief forms for constantly recurring and fundamental words; (3) the attainment of a stenographic vocabulary suitable for general business and governmental work; (4) the development of increased accuracy and precision in the formation of outlines to attain instant legibility.

PITMAN, 100 to 130 WORDS—Dr. Louise C. Barry; Fri. 5 to 7 beginning Sept. 26. \$12.

(Students who show ability to exceed the 130-word speed will be given ample opportunity.) The art and theory of phraseology in the acquisition of speed; the use of the ticks; the theory and practice of expert expedients including the principles of omission, fictitious primitives, alternatives and consecutives, and in general the technique and style of rapid Pitmanic shorthand. The dictation material will be the records of committee hearings. A conference and clinical meeting will be held two hours each week from 5 to 7 on Fridays, supplemented by practice exercises at times to be arranged convenient to the members of the class.

REPORTING, 130 to 150 WORDS—Miss Clara E. Richter; Mon. and Wed. 6 to 7 beginning Sept. 29. Repeated in the second semester. \$12.

The speed is based on actual word count and is the equivalent of 150 to 175, standard word count. This is a continuation of the 100 to 130 word class with special emphasis on reporting technique.

ADVANCED REPORTING, 150 WORDS AND UP—Miss Clara E. Richter; second semester.

SHORTHAND IN SPANISH—Miss Grace M. Bauer; Tues. 5:30 to 7:30 beginning Sept. 30. \$12.

This is an elementary course designed to cover the basic principles and outlines of the Spanish Gregg Shorthand Manual and to provide progressive dictation in Spanish through supplemental exercises and business correspondence, with the emphasis on accuracy.

Prerequisite: Knowledge of Spanish.

ADVANCED SHORTHAND IN SPANISH—Miss Grace M. Bauer; second semester.

ART

Undergraduate

ITALIAN PAINTING (III, 2 cr.)—Dr. Fritz Marti; Mon. 5 to 7 beginning Sept. 22. \$12.

A study of Italian painting from the thirteenth to the eighteenth century with especial emphasis on the Italian Renaissance. Lec-

tures illustrated with slides, and occasional visits to the National Gallery. Museum visits will be scheduled to suit all members of the class.

INTERIOR DECORATION (I, 1 cr.)—Miss Harriet Garrels; Wed. 5 to 6 beginning Sept. 24. \$6.

A course for amateurs and homemakers. Consideration of backgrounds, color schemes, furniture, arrangement, selection, and other elements which enter into creating interiors of charm and good taste.

ART WEAVING AND DESIGNING. Arrangements may be made through the Graduate School for instruction in classes in elementary and advanced art weaving and designing, taught by Madam Henderica van der Flier, graduate of the Royal Academy of Art in Holland. Inquire at Graduate School office.

LAYOUT AND APPLIED ART (See GRAPHIC PRESENTATION)

EXTENSION EDUCATION

Graduate and Advanced Undergraduate

Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

EXTENSION ORGANIZATION AND PROGRAM DETERMINATION (IV, V, 2 cr.)—Meredith C. Wilson and Barnard Joy; hours to be arranged, beginning Oct. 2. Room 5534 South Bldg. \$14.

An analytical review of the best procedures to be followed in developing State, county, and community programs of work, and outlining of plans of work looking to the orderly development of specific projects, including a discussion of the place of local leaders in extension teaching. The representative organizations of rural people are studied for the purpose of discovering points of contact and interest for cooperation in the conduct of extension work.

ORGANIZATION AND CONDUCT OF 4-H CLUB WORK (IV, V, 2 cr.)—Meredith C. Wilson and Barnard Joy; hours to be arranged, beginning Oct. 2. Room 5534 South Bldg. \$14.

The course includes the development of 4-H Club programs and organization considering: objectives, psychological groupings, community integration, program content, community, county, State, and Federal organization, selection and use of local leaders, annual plans of work, the evaluation. It takes into consideration the methods employed in 4-H work including projects, club meetings, demonstrations, judging work, exhibits, achievement days, camps, short courses, and leader training.

EXTENSION THESIS (V)—Meredith C. Wilson. Registration fee \$3.

An opportunity will be afforded to qualified persons who desire to undertake a study of an extension problem and submit a thesis. The amount of credit, to be determined by a thesis committee, will be based upon the nature of the problem, amount of work, and quality of the thesis.

EXTENSION METHODS (IV, V, 2 cr.)—Meredith C. Wilson and Barnard Joy; second semester.

SPECIAL COURSES

THE CLASSICS (St. John's College Program)—Dr. George Leckie; Tues. 7:30 to 9:30 beginning Sept. 30. Limited to 25 students. Non-credit. Special fee \$15.

This series of seminars, offered in cooperation with St. John's College of Annapolis, will base its discussions on books selected from the list of classics used in the St. John's Program. The course is planned to continue throughout the year. The first semester's reading includes crucial nineteenth century books in literature, political and social science, and philosophy. The fifteen meetings will discuss: 1. Rousseau, *The Social Contract*; 2. Rousseau, *Emile, or Education*; 3 and 4. Adam Smith, *The Wealth of Nations*; 5. Kant, *Principles of the Metaphysic of Ethics*; 6 and 7. The *Federalist Papers*; 8. Bentham, *Principles of Morals and Legislation*; 9. Malthus, *Principles of Population*; 10. Coleridge, *Biographia Literaria*; 11. Thackeray, *Vanity Fair*; 12. Dickens, *David Copperfield*; 13. Ibsen, *The Master Builder*, *Pillars of Society*, *The Doll's House*; 14. Dostoevski, *The Possessed*; 15. Tolstoi, *War and Peace*. (Note: Tutorial Classes, one in mathematics and one in language, are also offered to members of the seminars. Study in these tutorials should contribute to the depth and quality of seminar reading. Inquire at the office of the Graduate School or at the Office of Adult Education, St. John's College, Annapolis.)

SEMINAR ON THE HISTORY, AIMS, OBJECTIVES, AND ACCOMPLISHMENTS OF THE FARMERS' COOPERATIVE MOVEMENT—Thomas E. Howard, Chairman; Wed. 3:45 to 4:45 beginning Oct. 8. Special fee \$3.

This is a series of ten lectures and conferences presented by farm leaders who have taken an active part in the cooperative movement.

FACULTY

FIRST SEMESTER

(NOTE: This is not a complete faculty roster. It includes only those instructors who are offering courses during the first semester. It does not include instructors of courses given by other educational institutions and listed cooperatively in this catalog. Information about faculty members is necessarily brief and confined to that which is most significant for the courses taught.)

J. K. Ableiter, B.S., M.S., Wisconsin. Senior Soil Technologist, Bureau of Agricultural Chemistry and Engineering. Taught in North Dakota State Agricultural College. (Physical Sciences)

N. G. Barbella, A.B., M.S., George Washington. Associate Biochemist, Bureau of Animal Industry. Taught in George Washington University. (Language Aids)

Louise C. Barry, B.L., J.D., California. Stenographer, Solicitor's Office. (Office Skills)

Grace Bauer, A.B., M.A., George Washington. Stenographer, Division of American Republics, Department of State. (Office Skills)

Victor W. Bennett, A.B., Gettysburg; M.A., Pittsburgh; Ph.D., Washington. Associate Professor of Commerce, University of Maryland. (Public Administration)

W. W. Bennett, B.S., Pennsylvania State; M.D., Georgetown Medical School. Assistant Professor of Pathology and formerly Fellow in Pathology, Georgetown Medical School. (Biological Sciences)

F. C. Bishopp, B.S., Colorado State; M.S., Southern Methodist; Ph.D., Ohio State. Chief, Division of Insects Affecting Man and Animals, Bureau of Entomology and Plant Quarantine. Taught in Colorado Agricultural College and University of Maryland. (Biological Sciences)

Paul Bissell, B.S., Clemson. In Charge, Visual Information, Soil Conservation Service. (Engineering and Mechanical Arts)

Sidney F. Blake, A.B., M.A., Ph.D., Harvard. Senior Botanist, Bureau of Plant Industry. Formerly Professor of Botany, Stanford University. (Biological Sciences)

Samuel S. Board, A.B., Yale; graduate study, Columbia. Chief, Division of Training, Office of Personnel. Lecturer, American University. (Public Administration)

Jay Allan Bonsteel, B.S., Cornell; Ph.D., Johns Hopkins. Soil Scientist, Soil Conservation Service. Formerly Professor of Soil Investigations, Cornell University. (Physical Sciences)

C. Verne Bowen, B.S., Denison; M.S., Washington and Jefferson. Assistant Chemist, Bureau of Entomology and Plant Quarantine. Taught in Washington and Jefferson College. (Physical Sciences)

A. E. Brandt, B.S., M.S., Ph.D., Iowa State. Senior Mathematical Statistical Analyst, Soil Conservation Service. Research worker at Galton Laboratory, University College, London, under R. A. Fisher. Taught in Oregon State and Iowa State Colleges. (Mathematics and Statistics)

Ira T. Braunstein, LL.D., Royal University, Lemberg, Austria; graduate study, New York University. Clerk, Agricultural Adjustment Administration. (Language Aids)

James L. Buckley, LL.B., Georgetown. Chief, Division of Classification, Office of Personnel. (Public Administration)

Walter G. Cadmus, Jr., B.S. in Architectural Engineering, Kansas. Specifications Writer, Bureau of Agricultural Chemistry and Engineering. (Engineering and Mechanical Arts)

Herbert O. Calvery, B.S., Greenville; A.B., M.S., Ph.D., Illinois. Guggenheim Fellow, Research in Europe. Senior Pharmacologist, Food and Drug Administration, Federal Security Agency. Taught in Johns Hopkins University and University of Michigan Medical School. (Physical Sciences)

E. P. Clark, M.S., Ph.D., Iowa. Senior Chemist, Bureau of Entomology and Plant Quarantine. Taught in University of Iowa. Research Chemist in Rockefeller Institute for Medical Research, Bureau of Standards, and University of Alberta. (Physical Sciences)

Leland B. Clark, B.S., California. Senior Mechanic, Radiation Research, Smithsonian Institution. Formerly Instructor of Electrical Engineering, University of California, and Physicist, San Francisco Research Laboratory. (Engineering and Mechanical Arts)

Alice A. Coffman, Graduate, Fort Madison Business College. Stenographer, Office of the Solicitor. (Office Skills)

J. L. Colom, B.S. Chief, Division of Agricultural Cooperation, Pan American Union. Extensive travel and research in Latin America. (Language Aids)

Richard K. Cook, B.S., M.S., Ph.D., Illinois. Assistant Physicist, National Bureau of Standards. Taught in University of Illinois. (Physical Sciences)

Freeman G. Corkum, B.S., Massachusetts Institute of Technology. Associate Engineer (Naval Architect), Navy Department. (Engineering and Mechanical Arts)

Carey G. Cruikshank, A.B., King. In charge, Service and Training Section, Fish and Wildlife Service, Department of Interior. (Office Skills)

Joseph F. Daly, A.B., M.S., Catholic; Ph.D., Princeton. Instructor of Mathematics, Catholic University. (Mathematics and Statistics)

Tobias Dantzig, Licencie, Paris; Ph.D., Indiana. Professor of Mathematics, University of Maryland. (Mathematics and Statistics)

Raul D'Eca, M.A., Ph.D., George Washington. Associate in Portuguese, George Washington University. (Language Aids)

Raphael De Haro, A.B., North Texas State Teachers; LL.B., Dallas School of Law. Secretary, Office of the Vice President. (Language Aids)

W. Edwards Deming, B.S. in E.E., Wyoming; M.S., Colorado; Ph.D., Yale; summer courses with Fisher, Pearson, and Neyman. Mathematics Adviser, Bureau of the Census. Taught in Universities of Wyoming and Colorado, and Yale. Lecturer in Mathematics, National Bureau of Standards. (Mathematics and Statistics)

Maxwell A. De Voe, A.B., M.A., George Washington. Chief, Division of Organization and Personnel Management, Office of Personnel. Formerly Director of State Civil Service, Rhode Island. Taught in George Washington University and extension division of Syracuse University. (Public Administration)

George L. Edick, Chief Draftsman, Bureau of Agricultural Chemistry and Engineering. (Engineering and Mechanical Arts)

Douglas Ensminger, B.S., M.A., Missouri; Ph.D., Cornell. Social Scientist, Bureau of Agricultural Economics. Taught in Cornell University. (Economics and Social Sciences)

Mordecai Ezekiel, B.S., Maryland; M.S., Minnesota; Ph.D., Brookings Graduate School. Economic Adviser to the Secretary of Agriculture. Taught in University of Minnesota, Cornell, and New Hampshire College of Agriculture. Guggenheim Fellow, 1930. Author of books on current economic problems. (Economics and Social Sciences)

Henry H. Farquhar, A.B., Michigan; M.B.A., Harvard. General Inspector, Forest Service. Formerly Assistant Professor of Industrial Management, Harvard School of Business Administration. (Public Administration)

Edward J. Fagan, B.S. in E.E., Dayton; M.S., Ph.D., Ohio State. Assistant Professor of Mathematics, Catholic University. (Mathematics and Statistics)

Allan J. Fisher, B.S., Pennsylvania; Litt.M., Ph.D., Pittsburgh. Associate Research Accountant, Securities and Exchange Commission. Formerly Assistant Professor of Business Administration, University of Maryland. (Public Administration)

F. Raymond Fosberg, A.B., Pomona; M.S., Hawaii; Ph.D., Pennsylvania. Assistant Botanist, Division of Plant Exploration and Introduction, Bureau of Plant Industry. Taught in University of Hawaii. Eight years of research and field work on plants of the islands of the Pacific. (Biological Sciences)

Lester R. Frankel, A.B., New York; M.A., Columbia. Statistician, Work Projects Administration. Lecturer in Statistics, American University. (Mathematics and Statistics)

Richard L. Funkhouser, A.B., Dartmouth; M.A., Princeton. Secretary-Treasurer, American Statistical Association. Taught in Valley Ranch School for Boys and Amos Tuck School, Dartmouth College. (Mathematics and Statistics)

Harriet E. Garrels, A.B., M.A., George Washington. Art Supervisor, Public Schools, District of Columbia. Taught in Abbott Art School and Wilson Teachers College. (Art)

Wesley M. Gewehr, Ph.B., M.A., Ph.D., Chicago. Professor of History, University of Maryland. (Economics and Social Sciences)

Meyer A. Girshick, A.B., M.A., Columbia. Statistician, Bureau of Agricultural Economics. Taught in Anglo-American School, U.S. S.R., and Technicum for Foreign Languages, Moscow. (Mathematics and Statistics)

Victor H. Gottschalk, M.S., Missouri School of Mines and Metallurgy; Ph.D., Chicago. Senior Physicist, Metallurgical Division, U. S. Bureau of Mines, Department of Interior. Formerly Head of Department of Chemistry, Missouri School of Mines and Metallurgy. (Physical Sciences)

Edward H. Graham, B.S., Ph.D., Pittsburgh. Biologist, Biology Division, Soil Conservation Service. Taught in University of Pittsburgh. (Biological Sciences)

Glenn A. Greathouse, B.Ed., Illinois State Normal; M.S., Illinois; Ph.D., Duke. Physiologist, Bureau of Plant Industry. Formerly Assistant Professor of Biophysics and Plant Physiology, University of Maryland. (Biological Sciences)

Philip Leonard Green, Latin American Specialist, Office of Foreign Agricultural Relations. Four years' residence and travel in Latin America. Taught Latin American civilization in Inter-American Institute of Roerich Museum, New York; College of City of New York; American University; summer session, University of Maryland. (Economics and Social Sciences)

Reginald G. Hainsworth, A.B., George Washington; M.A., American. In charge, Graphic Section, Bureau of Agricultural Economics. (Mathematics and Statistics)

William T. Ham, A.B., College of the Pacific; M.A., Stanford; M.A., Ph.D., Harvard. Principal Agricultural Economist, Bureau of Agricultural Economics. Taught in Stanford and Harvard. (Economics and Social Sciences)

William J. Hamer, B.S., Junta; Ph.D., Yale. Associate Chemist, National Bureau of Standards, Department of Commerce. Taught in Junta College and Yale. Research Associate, Massachusetts Institute of Technology; Research Fellow, Yale. (Physical Sciences)

Erwin C. Hannum, B.S. in C.E., Syracuse; M.S., School of Citizenship, Syracuse; work on Ph.D., Columbia. Senior Administrative Analyst, Bureau of the Budget. Taught in College of City of New York. (Public Administration)

Carl H. Hanson, B.S., Wisconsin; Graduate, River Falls State Normal. Formerly Specialist in Visual Instruction, Extension Service. Thirty years' experience in lecturing and teaching, primarily in visual instruction, including photography. (Engineering and Mechanical Arts)

Robert S. Hare, A.B., Kansas; M.A., George Washington. Special Assistant to the Director of Personnel. Formerly Chief Investigator, Civil Service Commission and Chief, Division of Classification, Planning, and Surveys, Department of Agriculture. (Public Administration)

Susan E. Harman, B.Ed., Nebraska State Teachers; A.B., M.A., Nebraska; Ph.D., Johns Hopkins. Associate Professor of English, University of Maryland. (Language Aids)

Benarthur C. Haynes, B.S., M.S., California Institute of Technology. Air Safety Specialist in Meteorology, Department of Commerce. Taught in California Institute of Technology and Boeing School of Aeronautics. (Physical Sciences)

Thomas E. Howard, Senior Administrative Officer, Agricultural Adjustment Administration. Formerly organizer and officer of numerous farmers' cooperatives. (Special Courses)

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Cornelius H. Muller, A.B., M.A., Texas; Ph.D., Illinois. Assistant Botanist, Bureau of Plant Industry. Taught in Universities of Texas and Illinois. (Biological Sciences)

William Muller, LL.B., Washington College of Law. Assistant Procedure Specialist, Office of Plant and Operations. (Office Skills)

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Oswald Nielsen, Ph.B., Chicago; Ph.D., Minnesota; major in accounting. Statistician, Federal Crop Insurance Corporation. Taught in University of Minnesota and American University. (Public Administration)

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Olivia Russell, A.B., Barnard; M.A., Columbia; graduate study toward Ph.D., in Romance Languages, Columbia. Teacher of Spanish, Woodrow Wilson High School, District of Columbia. (Language Aids)

Mary Sabarth, educated in Germany. Special work in languages at University of Berlin. Taught in Robert College, Constantinople, Turkey; Barnard College, Columbia University; Wells College; and Fairmount Junior College. Traveled extensively in Europe, Asia, and Africa. (Language Aids)

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Charles F. Scarle, B.S., Cornell; M.S., Drake; Ph.D., Columbia. Executive Assistant for Scientific Services, Weather Bureau, Department of Commerce. Formerly Director, Division of Economics, Commodity Credit Corporation. Economic Adviser, Federal Farm Board and Agricultural Adjustment Administration. Taught in Cornell University. (Economics and Social Sciences)

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Max J. Wasserman, A.B., Cornell; M.A., Illinois; Dr. es Sc. Econ., University of Lyons, France. Chief, Information Unit, Export Control, Department of Commerce. Taught in Universities of Illinois, Chicago, and Lyons (France). Fellow Social Science Research Council in France, 1927-29. (Economics and Social Sciences)

Michael T. Wermel, B.S., New York; M.S., Ph.D., Columbia. Technical Adviser, Social Security Board. Formerly Instructor and Assistant Professor of Economics, Brooklyn College. (Economics and Social Sciences)

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David Ziskind, Ph.B., J.D., Chicago; M.A., Southern California; Ph.D., Johns Hopkins. Senior Examiner, Department of Labor. Taught in Southwestern University, Los Angeles. Formerly Labor Adviser in N.R.A. and Resettlement Administration. (Economics and Social Sciences)

MAIL REGISTRATION

Persons who desire to register by mail will be sent a mail registration form upon request.

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Publications of the Graduate School

DESIGN FOR DEFENSE. A symposium: **Public Opinion** by Max Lerner; **Technology** by Walter Rautenstrauch; **Diplomacy** by Adolf A. Berle, Jr.; **Agriculture** by John D. Black. Published in cooperation with the American Council on Public Affairs. Paper bound (1941), 40 pp. 35c.

FACSIMILES OF TWO PAPERS BY BAYES (his famous essay on probability, and a note on divergent series), with commentaries by E. C. Molina and W. Edwards Deming. Cloth bound (1940), 70 pp. \$1.00.

STATISTICAL METHOD FROM THE VIEWPOINT OF QUALITY CONTROL by Walter A. Shewhart, edited by W. Edwards Deming. Cloth bound (1939), 155 pp. \$2.50.

ON THE STATISTICAL THEORY OF ERRORS by W. Edwards Deming and Raymond T. Birge. Paper bound (1938), 50 pp. 35c.

ON LEAST SQUARES by W. Edwards Deming. Paper bound, mimeographed (1938), 181 pp. \$1.50.

ADMINISTRATIVE MANAGEMENT. Lectures, with discussion summaries, by ten outstanding leaders in the management field, including Tead, Person, Uhrbrock, Babcock, Hicks, and Donham. Cloth bound (1938), 108 pp. \$1.00; paper bound 75c.

ELEMENTS OF PERSONNEL ADMINISTRATION. Lectures, with accompanying problems and discussions, by eight outstanding leaders in this field, including White, Tead, Feldman, Person, and Stockberger. Paper bound (1935), 102 pp. 50c.

THE ADJUSTMENT OF PERSONALITY. A series of lectures by ten outstanding leaders in this field. Paper bound, multilithed (1939), 171 pp. 50c.

CURRENT ECONOMIC PROBLEMS, 1936. Twenty-two lectures by such outstanding economists as Hansen, Lubin, Viner, Schumpeter, Goldenweiser, Saposs, Eastman, and Moulton. Paper bound, mimeographed (1936), 276 pp. 50c.

ADMINISTRATION. Lectures by Arthur MacMahon, John Dickinson, John M. Gaus, and Luther Gulick. Mimeographed (1940), 48 pp. 25c.

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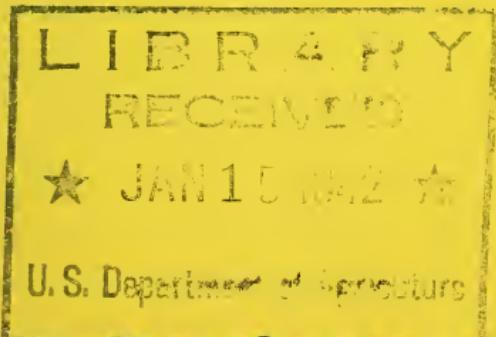
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Second Semester, 1941-42

BULLETIN OF COURSES

Making Facilities Available for
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20th Anniversary

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Department of Agriculture

DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

GENERAL INFORMATION

Origin and Authority. This is the twentieth anniversary of the establishment of the Graduate School. Facilities for study and research in the government departments are made available by Congressional authority to qualified individuals, students, and graduates of institutions of learning in the several states and the District of Columbia under such rules and restrictions as the heads of departments and bureaus may prescribe (Joint Res. April 12, 1892, 27 Stat. 395; Deficiency Act of March 3, 1901, 31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act of the Department, the Graduate School was organized in 1921 with the approval and encouragement of the Secretary of Agriculture.

Objectives. 1. To provide graduate education acceptable in graduate institutions for the convenience of employees who desire advanced degrees but find it difficult, both for personal and official reasons, to complete all study in residence at the degree-granting institution.

2. To supplement in-service training programs conducted on government time and at government expense, by making it possible for employees to train themselves both intensively and extensively for proficiency in their present positions and for advancement to better positions.

3. To provide certain cultural, creative, and leisure-time opportunities for employees.

4. To assure the attainment of these objectives by making available to employees the experience, knowledge, and instructional talent of outstanding specialists in the federal service.

Administration. The School is a self-supporting, non-profit institution. It receives no federal funds. Its government is vested in the General Administration Board, appointed by the Secretary of Agriculture. Its administration is vested in the Director, appointed by the Board, and a small administrative staff. These have the advisory assistance of the Director Emeritus and Educational Adviser and eight committees named by the Board, one for each of the major divisions of the School. Members of the Board and of the committees serve without compensation.

Faculty. Graduate School instructors are drawn almost entirely from the federal service, a source of talent and expertness unexcelled anywhere in the nation. Faculty members combine excellent academic training, college teaching experience, and daily practice in the application of the subject-matter taught. For a brief note about each instructor, turn to the back of this booklet.

Library Facilities. The Department of Agriculture Library, containing approximately half a million books, is open to Graduate School students from 8:00 a.m. to 8:00 p.m.

Library Assistantships. A limited number of library assistantships are open to qualified students from the Department of Agriculture who wish to use this method of paying their fees. All work is done after official hours. Students interested should inquire at the School Office.

Lectures and Publications. Each semester the School sponsors one or more lecture series in which nationally known authorities participate. Topics for this semester will be announced later. Several of these lectures, and a few other scholarly works, are available as Graduate School publications. (See back cover.)

REGISTRATION AND FEES

Second Semester Begins February 2, 1942

Registration. Register early. Avoid late registration congestion. Register in Room 1031, South Building, Department of Agriculture, before the semester opens on February 2.

Late Registration Fee. Students who register after February 14 must pay an additional fee of \$1.00 a course. This does not apply to courses which begin after February 14 nor to persons who submit written evidence that official government action prevented their registration prior to that date.

Fees. The fee for each course is indicated in the course description. Unless otherwise stated, fees are computed at the rate of \$6.00 a credit hour for undergraduate courses marked I, II, and III and \$7.00 a credit hour for graduate and the most advanced undergraduate courses, marked IV and V. These fees, unlike those in previous years, cover credit as well as non-credit charges. Official certification of the student's record in the Graduate School will be issued upon payment of 50 cents for each copy.

Partial Payment Plan. Arrangements may be made at the time of registration for paying in two installments, for which there will be an additional service charge of \$1.00 for each course. The first installment of not less than half the full fee, plus the \$1.00 service charge, must be paid at the time of registration. The second and final installment must be paid on or before March 18. Failure to pay will result in automatic suspension from class.

Refunds. Students withdrawing from classes will not be entitled to refunds, except that—

1. When an announced course is not given for want of a sufficient number of students, the fee will be returned in full.
2. When a student is OFFICIALLY transferred out of the Washington area his fees will be refunded in the amount proportionate to the unexpired portion of the semester, provided written evidence of such transfer is presented. This does not apply to cases arising out of the student's voluntary action.
3. When a student is granted permission to withdraw from a class during the first two weeks of the course, his fee, minus a \$3 registration charge, will be refunded.

Refunds are made on no other basis. All adjustments are made as of the date on which application for refund is received.

Room Assignments. Room assignments for classes may be obtained from the School Office after January 30 or from the Graduate School bulletin board outside Room 1031, South Building.

CREDIT AND CERTIFICATION

Academic Credit. Credits are accepted by the Civil Service Commission to fulfill college educational qualifications for taking civil service examinations. Courses are of college grade for the levels indicated, with the exception of a few non-credit courses given to meet special training needs of federal employees, and credit for the work is accepted by many leading colleges and universities when it meets the requirements of the program selected by the students. Because of the exceptional conditions under which the School operates, it has seemed neither necessary nor desirable to educators within and outside the government that the School be included on the lists of accrediting associations.

Planning Your Program. Students who want credit certified to a college or university should, whenever possible, arrange their programs with the institution to which credits are to be sent. Graduate programs should be arranged in advance through the dean of the graduate school of the institution from which the degree is contemplated. The latest catalogs of colleges and universities are available for examination in the Graduate School Office. Officers of the School and instructors will be glad to assist students in selecting courses.

Certification of Student's Record. Upon the student's request, an official certification bearing the seal of the Graduate School will be sent to him or to an educational institution or other organization designated by him. The fee for this service, beginning with the academic year 1941-42, will be 50 cents a copy prepaid. (Note: A student who desires certification of work done prior to the academic year 1941-42 must comply with certification rules in effect at the time he was enrolled.)

Cooperation with American University. The Graduate School of the Department of Agriculture and the Graduate Division of the School of Social Sciences and Public Affairs of the American University have found it mutually advantageous to cooperate in certain portions of their graduate programs. Certain courses in each school which supplement courses in the other are offered cooperatively. Graduate School students who take such courses (those starred) are eligible for residence credit at American University.

Transcripts. Any student working for academic credit should secure from the schools attended a transcript of his academic work and file it with the Secretary of the Graduate School, Eva M. Johnson. Students who enroll in courses given in cooperation with American University and desire credit at American must file a transcript with that institution and otherwise comply with its rules.

HOURS OF CLASS MEETING

All class schedules are subject to such changes as may be necessary in view of the emergency. Changes will be made to accommodate as many employees as possible.

The system of staggered hours of employees in the various federal departments and agencies has made it impossible to schedule classes to meet the needs and convenience of all prospective students. In continuing its practice of beginning late afternoon classes at 5 o'clock, the School has attempted to make its classes available to a maximum number of federal employees without serious inconvenience to Agriculture employees, who are officially dismissed at 3:45 o'clock.

All class hours may be modified, however, if the class members can agree upon a preferred hour when the class first convenes.

"Without question the most elaborate and most successful in-service training institution is the Graduate School of the Department of Agriculture. The high standards of instruction and the breadth of training afforded by the Graduate School mark it as one of the foremost training institutions of its kind in the world."—Leonard D. White, Professor of Public Administration, University of Chicago, and former member of the Civil Service Commission. (By permission of Professor White and the Macmillan Company).

DESCRIPTION OF COURSES

Explanation

Roman numerals following course titles indicate college year levels—e.g., Economics of Imperfect Competition (V, 3 cr.) means a fifth-year or graduate course carrying three credits.

The asterisk (*) preceding a course title indicates cooperation with American University.

Unless otherwise stated, new students will not be admitted to courses marked "Continuation of fall semester" unless they have had the fall semester's work or equivalent or consent of instructor.

DEPARTMENT OF BIOLOGICAL SCIENCES

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Undergraduate

FUNDAMENTALS OF GARDENING (II, 2 cr.)—William R. Beattie; Tues. 7:30 to 9:30 beginning Feb. 3. \$12.

Historical background of gardening in America; plant breeding and improvement; soils, soil types of the Washington area, soil reactions and corrections in relation to various plants, fertilizers, soil preparation; seeds and plants, propagation, seedage and handling of plant material, special equipment including frames and greenhouses; climatic limitations, planting dates, protection of plants from heat and cold; plant physiology and growth functions, soilless gardening; types and varieties of plants adapted for growing in the Washington area, ornamentals, vegetables; cultural practices, including control of weeds, irrigation, mulching, shading; diseases and insects, control measures including equipment and materials; utilization of garden products, canning, drying, storage; general improvement and treatment of the home and its surroundings.

SYSTEMATIC BOTANY (II, 2 cr. each sem.)—Dr. S. F. Blake; Mon. and Wed. 5 to 6 beginning Feb. 2. Continuation of fall semester. \$12.

This course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

Graduate and Advanced Undergraduate

PRINCIPLES OF PLANT ECOLOGY (III, 2 cr. each sem.)—Dr. C. H. Muller; Wed. and Fri. 5 to 6 beginning Feb. 4. Continuation of fall semester. \$12.

The theories of plant communities. The structure and habitat relations of both successional and climax communities will be considered. Emphasis will be placed upon the climax communities of North America. A consideration of the philosophies of the structure and functions of communities will summarize the course.

ADVANCED PLANT ECOLOGY (IV, V, 2 cr. each sem.)—Dr. M. B. Waite; 1942-43.

SEMINAR IN PLANT ECOLOGY (IV, V, 1 cr. each sem.)—Dr. C. H. Muller; Fri. 6 to 7 beginning Feb. 6. \$7.

A discussion group for both students and graduates in all fields of plant ecology, theoretical or applied. Current ecological literature will be presented as brief abstracts, and reviews of the accumulated literature on selected topics will be read. Student participation in both is required. Ample time will be reserved for discussion and criticism of the literature.

Prerequisite: A course in ecology or its equivalent.

LAND MANAGEMENT ECOLOGY (III, 3 cr.)—Dr. Edward H. Graham; fall, 1942-43.

USEFUL PLANTS OF THE AMERICAN TROPICS (III, 3 cr.)—Dr. F. R. Fosberg; fall, 1942-1943.

PLANT PHYSIOLOGY (IV, V, 2 cr. each sem.)—Dr. Glenn A. Great-house; 1943-44.

PLANT BIOPHYSICS (IV, V, 2 cr. each sem.)—Dr. Glenn A. Great-house; 1942-43.

MEDICAL AND VETERINARY ENTOMOLOGY (IV, V, 2 cr.)—Dr. F. C. Bishop; fall, 1942-43.

DEPARTMENT OF PHYSICAL SCIENCES

Departmental Committee

CHARLES E. KELLOGG, Ph.D., Chief, Division of Soil Survey, Bureau of Plant Industry (Chairman)

ARNOLD K. BALLS, Ph.D., Head Chemist, Bureau of Agricultural Chemistry and Engineering

LELA E. BOOHER, Ph.D., Chief, Foods and Nutrition Division, Bureau of Home Economics

C. G. ROSSBY, D.Sc., Assistant Chief, Weather Bureau, Department of Commerce

GEORGE W. TRAYER, C.E., Chief, Division of Forest Products, Forest Service

ASTRONOMY

PRACTICAL ASTRONOMY (III, IV, 2 cr.)—A. Hughlett Mason; Tues. 5 to 7 beginning Feb. 3. \$12.

Astronomical systems of coordinates; determination and conversion of time; secular and periodic changes; corrections to observations; use of the transit and sextant; determination of latitude, longitude and azimuth. This course is intended for students interested in celestial navigation, higher surveying, or geodesy.

CHEMISTRY

Undergraduate

GENERAL INORGANIC CHEMISTRY (non-credit)—Dr. E. P. Clarke; Mon. 5 to 7 beginning Feb. 2. Continuation of fall semester. \$12.

Designed for students whose work is not in the chemical field but who desire a general knowledge of the subject as an aid in reading and understanding other subjects in which chemistry plays a minor role. The course will consist of lectures, amply demonstrated, covering the atomic and molecular theory; valence; the gas laws; and a general consideration of the elements. After the completion of the foregoing material a brief introduction to the system employed in quantitative analysis will be presented.

INTRODUCTION TO ORGANIC CHEMISTRY (II, 2 cr. each sem.)—Dr. E. P. Clark; Thurs. 5 to 7 beginning Feb. 5. Continuation of fall semester. \$12.

The fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The second semester will be devoted to the consideration of the aromatic and heterocyclic series.

Graduate and Advanced Undergraduate

PHYSICAL CHEMISTRY (III, 2 cr. each sem.)—Dr. Walter J. Hamer; Tues. 5 to 7 beginning Feb. 3. Continuation of fall semester. \$12.

Classification of matter; atomic and kinetic theories; atomic and molecular structure; solutions; the phase rule; chemical kinetics; thermochemistry and thermodynamics; flame and explosive temperatures; photochemistry; radioactive chemical changes; electrochemistry; conduction by electrolytes.

QUANTITATIVE MICRO-ORGANIC ANALYSIS (III, IV, 1 cr.)—Dr. E. P. Clark; Wed. 5 to 6 at Beltsville, beginning Feb. 4. \$6.

A lecture course covering the general principles of organic analysis with special emphasis upon micro- and semi-micro procedures. Consideration will be given the desirability of the several systems under various laboratory conditions, as well as the selection and fabrication of necessary apparatus for each. The lectures will be supplemented with demonstrations of equipment and manipulative procedure.

ADVANCED ORGANIC CHEMISTRY (IV, 2 cr. each sem.)—C. Verne Bowen; Tues. 5 to 7 beginning Feb. 3. Continuation of fall semester. \$14.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic and aromatic chemistry will be presented and recent progress in the chemistry sterols, vitamins, and sex hormones will be given.

Prerequisites: One year general chemistry; one year organic.

PHYSIOLOGICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. Herbert O. Calvery; Wed. 5 to 7 beginning Feb. 4. Continuation of fall semester. \$14.

A lecture course on the principles of biochemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e.g., muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; the digestion and absorption of the principal foodstuffs; metabolism of the proteins, fats, and carbohydrates; mineral metabolism; the chemical constituents of the urine; and finally a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

Prerequisites: One year general chemistry; one year organic.

ELECTROCHEMISTRY (V, 2 cr.)—Dr. Walter J. Hamer; Thurs. 5 to 7 beginning Feb. 5. \$14.

A lecture course designed to present the fundamentals of electrochemistry. This course will deal with the conduction by electrolytes, transference numbers, the mechanism of galvanic cells, electrode potentials, potentiometric titrations, conductometric titrations, the polarograph, diffusion currents, electrokinetic phenomena including electrophoresis and electro-osmosis, ionization constants, pH or hydrogen ion activity, and passivity and overvoltage of electrodes. The factors involved in electroplating, electrodialysis, and electropolishing will be briefly studied.

GLASS BLOWING (See ENGINEERING AND MECHANICAL ARTS).

GEOGRAPHY AND GEOLOGY

Graduate and Advanced Undergraduate

PHYSIOGRAPHY OF THE UNITED STATES (III, IV, 2 cr.)—Dr. C. F. Stewart Sharpe; Tues. 5 to 7 beginning Feb. 3. \$12.

The geomorphic processes that have created and shaped the present surface of the land are explained with reference to the modifying factors of climate, vegetation, and human activity. The physiographic features of the United States are treated regionally and are interpreted in their relation to current problems of water control and land use. The object of the course is to provide a broad physical basis for those interested in land problems.

OPTICAL MINERALOGY (V, 2 cr.)—Dr. Earl Ingerson; fall, 1942-43.

MICROSCOPICAL PETROGRAPHY (V, 2 cr.)—Dr. Earl Ingerson; Fri. at 5 in Geophysical Laboratory, beginning Feb. 6. One lecture and three laboratory hours a week; laboratory hours to be arranged. Special fee \$15.

Petrography. Identification of rock forming minerals in thin section. Classification of igneous and metamorphic rocks from their mineral composition, texture and structure as determined in thin section.

Prerequisite: Optical Mineralogy.

METALLURGY

PRINCIPLES OF PHYSICAL METALLURGY (III, 2 cr.)—Dr. Victor H. Gottschalk; fall, 1942-43.

ADVANCED PHYSICAL METALLURGY (IV, V, 2 cr.)—Dr. Blake M. Loring; Tues. 7:15 to 9:15 beginning Feb. 3. \$14.

Some basic concepts of the physics of metals will be discussed in order to develop a better understanding of the common mechanical tests and manufacturing processes. The topics will include the following: definition of a metal; introduction to the crystalline nature of matter; classification of metallic elements according to crystalline structure; relationship between crystalline structure and physical properties; the equilibrium diagram and its relation to physical properties and crystalline structure; introduction to X-ray metallography with calculations from diffraction patterns of metals (illustrated); X-ray evidence of cold working and recrystallization; interval stresses in metals; plastic deformation; theory of metal hardening, ferrous and non-ferrous; advanced physical testing of metals covering fatigue, creep, and damping capacity. The class will be permitted to select for discussion manufacturing processes of most general interest. Forging and rolling will be included.

METEOROLOGY

Graduate and Advanced Undergraduate

DESCRIPTIVE METEOROLOGY (III, IV, 2 cr.)—Benarthur C. Haynes,
assisted by specialists; fall, 1942-43.

SYNOPTIC WEATHER MAP ANALYSIS (IV, V, 2 cr. each sem.)—
Benarthur C. Haynes; Tues. 5 to 7 beginning Feb. 3. Continuation of fall semester. \$14 and laboratory fee of \$2.

A laboratory course open to not more than twelve students. The first semester covers practice in the analysis of synoptic charts of the surface and an introduction into upper-air analysis. The second semester will be a continuation of surface analysis with added emphasis on various upper-air charts and the application of modern forecasting methods.

FORECASTING ANALYSIS (IV, 2 cr.)—Benarthur C. Haynes; Thurs.
5 to 7 beginning Feb. 5. \$14.

Application of modern meteorological theories to forecasting. Displacements of fronts and pressure systems, frontogenesis and frontolysis, frontal and air mass weather, fog and stratus cloud forecasting, thunderstorm forecasting and special weather forecasts.

Prerequisites: Descriptive meteorology or an equivalent general course in meteorology; elementary knowledge of differential and integral calculus. The continuity of the course will follow the first semester of the descriptive meteorology course.

CLIMATOLOGY (III, IV, 2 cr.)—Dr. C. Warren Thornthwaite and
David I. Blumenstock; Tues. 5 to 7 beginning Feb. 3. \$12.
Climatology, based on newer concepts of physical meteorology. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement in its relation to climatic or meteorologic conditions will be discussed.

PHYSICS

Graduate

ANALYTICAL MECHANICS (V, 2 cr. each sem.)—Dr. Richard K. Cook; Tues. 5 to 7 beginning Feb. 3. \$14. (For complete description, see MATHEMATICS.)

THERMODYNAMICS (IV, V, 2 cr. each sem.)—Dr. F. G. Brickwedde;
1942-43.

SOIL SCIENCE

Undergraduate

SOIL CONSERVATION (II, 2 cr.)—Dr. Jay A. Bonsteel; fall, 1942-43.

Graduate and Advanced Undergraduate

MAN AND SOIL THROUGH THE AGES—Dr. Hellmut de Terra.
Offered jointly with the Department of Economics and Social Sciences. (See description under SPECIAL COURSES.)

SOIL FERTILITY (III, IV, 3 cr.)—J. K. Ableiter; fall, 1942-43.

SOILS: THEIR MORPHOLOGY, GENESIS, AND CLASSIFICATION (IV, V, 3 cr.)—Dr. Charles E. Kellogg; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. \$21.

The nature of soils and the broad principles governing their behavior are first discussed, followed by consideration of soil morphology, formation, and classification. Particular attention is given to the characteristics of the great soil groups and their genesis in relationship to the physical and biological forces of the environment. The soil geography of the United States is dealt with broadly, but some examples from other parts of the world are used. Throughout the course, the relationships of soil characteristics to agricultural development, soil use and conservation, and patterns of human occupancy are emphasized.

Prerequisites: Freshman chemistry or its equivalent. Previous or collateral reading in plant physiology, geology, geography, and logic would be helpful, but not essential.

SOILS AND PLANNING—SEMINAR (V, 1 cr.)—Dr. Charles E. Kellogg;
Fri. at 5 beginning Feb. 6. \$7.

Seminar discussions dealing with the use of the data and technique of soil science in land classification and land-use planning. Present problems of coordination of soil data with those from other disciplines will be dealt with and illustrated with particular examples. Good preparation in soil science desirable.

DEPARTMENT OF MATHEMATICS AND STATISTICS

Departmental Committee

N. EDWARDS DEMING, Ph.D., Mathematical Adviser, Bureau of the Census (Chairman)
LOUIS BEAN, M.B.A., Head Agricultural Economist, Bureau of the cultural Economics
W. F. CALLANDER, LL.B., Chief, Division of Agricultural Statistics, Agricultural Marketing Service
B. R. STAUBER, M.A., In Charge, Land Policy-Credit Coordination, Office of Land Use Coordination
O. C. STINE, Ph.D., Chief, Division of Statistical and Historical Research, Bureau of Agricultural Economics

MATHEMATICS

Undergraduate

PRACTICAL ARITHMETIC—Albert J. Mattern; fall semester only.

1. ALGEBRA (I, 3 cr.)—Harry J. Winslow; fall semester only.

2. TRIGONOMETRY AND ANALYTIC GEOMETRY (I, 3 cr.)—Harry J. Winslow; Tues. and Thurs. 5 to 6:45 with an intermission, beginning Feb. 3. Spring semester only. \$18.

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves, polar coordinates; families of curves with one or more parameters. Parametric equations of curves. Radical axis. Graphic solution of equations. Some three-dimensional geometry.

Prerequisites: Mathematics 1 or equivalent.

3, 4. CALCULUS (II, 3 cr. each sem.)—Dr. C. Winston; Mon. and Wed. 5 to 7 beginning Feb. 2. Continuation of fall semester. Offered in alternate years. \$18.

Second semester: Standard integral forms. Partial and total derivatives. Constrained maxima and minima in functions of two variables. Lagrange multipliers. Interpolation. Taylor's series with one or more independent variables. Propagation of errors. Operations with series. Multiple integrals. Line integrals. Approximate integration; the Euler-Maclaurin formula; mechanical integration. Function scales. History and application stressed.

Prerequisites: Mathematics 1 and 2.

Graduate and Advanced Undergraduate

American University will grant residence

credit for any course listed below.

5. HIGHER ALGEBRA (IV, 3 cr.)—Dr. E. J. Finan; fall, 1942-43.

8. COORDINATE GEOMETRY AND VECTORS (IV, 2 cr.)—Dr. S. B. Littauer; Tues. 7 to 9, beginning Feb. 3. Offered in alternate years. \$14.

Lines, planes, conics, quadric surfaces. Tangents, normals, transformations, invariants. Determinants will be used freely. Problems in multiple correlation and curve fitting, and the near indeterminacy of linear equations, will be examined geometrically. The vector notation will be studied, and many of the equations involving tangents and normals will be compressed by vector notation.

Prerequisite: Mathematics 1, 2, 3, 4.

9. NOMOGRAMS (IV, 1 cr.)—Eugene Raser; fall, 1943-44.

12. INTERPOLATION (V)—Dr. W. Edwards Deming; offered every fourth year; due in 1942-43.

13. MATHEMATICS OF INVESTMENT (V)—Offered every third year; due in 1942-43.

15, 16. ADVANCED CALCULUS (IV, V)—Offered every fourth year; due in 1942-43.

17, 18. DIFFERENTIAL EQUATIONS (V)—Offered in alternate years; due in 1942-43.

19, 20. LINEAR ALGEBRA (V)—M. A. Girshick; offered every third year; due in 1943-44.

21, 22. THEORY OF INFINITE PROCESSES (V)—Dr. C. Winston; offered every fourth year; due in 1942-43.

23, 24. THEORY OF FUNCTIONS (V)—Dr. C. Winston; offered every fourth year; due in 1944-45.

25, 26. ANALYTICAL MECHANICS (V, 2 cr. each sem.)—Dr. Richard K. Cook; Tues. 5 to 7 beginning Feb. 3. Continuation of fall semester. Offered in alternate years. \$14.

Potential theory, mechanics of systems of particles and of rigid bodies, vibrating systems, rotating systems, the principle of least action, Hamilton's principle, relativity kinematics and dynamics. Similarities between the equations of mechanics and those of other fields of physics will be pointed out. Topics of special interest to the class will be taken up if time permits.

Prerequisites: Calculus; college physics and a first course in statics and dynamics.

27, 28. SELECTED TOPICS IN THE HISTORY AND PHILOSOPHY OF MATHEMATICS (V, 2 cr. each sem.)—Prof. Tobias Dantzig; Offered in alternate years.

29. INTERPOLATION, APPROXIMATION, AND MECHANICAL QUADRATURE (V)—Prof. J. Shohat; offered every four years; due in 1942-43.

31, 32. STATISTICAL MECHANICS AND KINETIC THEORY (V)—Dr. F. G. Brickwedde; offered every three years; due in 1942-43.

STATISTICS

OUTSIDE LECTURES. The Graduate School has made a practice of bringing one or two outside leaders in statistical thinking to Washington annually. In the past, the following eminent authorities have lectured here: R. A. Fisher, John Wishart, Walter A. Shewhart, J. Neyman, Frank Yates, Harold Hotelling, and Harold Jeffreys. Some of these lectures are available in print; see the list of publications at the back.

SEMINARS IN SAMPLING AND STATISTICAL INFERENCE—Meetings are held approximately semi-monthly under the direction of Dr. W. Edwards Deming. This is not a credit course, and no fee is charged; registration, however, is required. Applications should be sent in writing to the Director. Notices regarding meetings are mailed to those who register.

Undergraduate

1. GRAPHIC METHODS FOR PRESENTING STATISTICAL DATA (II, 2 cr.)—R. G. Hainsworth; Wed. 5 to 8 beginning Feb. 4. One hour lecture, two hours laboratory. \$12.

Application of various classes, forms, and types of illustrations. Actual working examples in time series charts, frequency diagrams, graphic correlation charts, statistical maps, pictorial symbol charts, and other illustrative examples. Reduction, reproduction, and color application to graphic mapping and charting. Lettering, short-cut methods, and standardization rules.

Prerequisites: A first course in statistics or experience to satisfy the instructor.

3. INTRODUCTION TO STATISTICAL ANALYSIS, 1st half.

SECTION A (I, 2-3 cr.)—Dr. O. A. Pope; fall semester only.

SECTION B (I, 2 cr.)—Dr. Benjamin Tepping; Tues. 5 to 7 beginning Feb. 3. \$12.

This is a non-mathematical elementary course designed for statistical clerks who wish to become familiar with the more common statistical terms and formulas, and who wish to learn how to lay out the forms for machine calculations. Methods of checking calculations will be emphasized. The course will include the presentation of data and the results of calculations in tables and charts.

No prerequisites.

SECTION C (II, 2 cr.)—R. L. Funkhouser; Mon. 7 to 9 beginning Feb. 2. \$12.

Designed for students of business and economics. The collecting of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series. Attention will be given to the preparation of formulas for machine calculations.

Prerequisites: Mathematics 1 and 2.

4. INTRODUCTION TO STATISTICAL ANALYSIS, 2d half.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang; Thurs. 7 to 9 beginning Feb. 5. \$12.

Non-mathematical—a continuation of Course 3, Section B. Problems in the relation between two variables; association, correlation, and regression. Some elementary aspects of sampling.

SECTION C (II, 2 cr.)—Sidney Wilcox; Tues. and Thurs. 5 to 6 beginning Feb. 3. \$12.

This is a continuation of Course 3, Section C. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to the analysis of variance and its relation to correlation.

Introduction to statistical inference. Adaptation of formulas to machine calculation.

5. MACHINE CALCULATION (I, 1 cr.)—Donald W. Geesa; Mon. 5 to 7 beginning Feb. 2. Special fee \$9.

Simple operations on different kinds of calculators; treatment of decimal points; extraction of roots, cumulative moment processes with tape machines; short-cuts and checks; adaptation of formulas to machine calculation.

Prerequisite: High school algebra and statistical experience.

7. STATISTICAL APPLICATIONS OF TABULATING EQUIPMENT (III, 1 cr.)—Milton Kaufman; Wed. 7 to 9 beginning Feb. 4, at the office of the I. B. M., 1111 Connecticut Avenue. Registration limited to 30. Special fee \$9.

The punch card method. The functions of the principal machines. The instruction will cover the actual wiring of all types of I. B. M. tabulating equipment as well as the theory of their use in statistical work. The use of cards to obtain sums of squares and cross products in correlation and curve fitting will be demonstrated.

8. ADVANCED APPLICATIONS OF TABULATING EQUIPMENT (III, 1 cr.)—Milton Kaufman; Fri. 7 to 9 beginning Feb. 6, at the office of the I. B. M., 1111 Connecticut Avenue. Registration limited to 30. Special fee \$9.

The solution of complex problems in the application of tabulating equipment. The instruction will include the actual operation and wiring of the principal machines involved.

Prerequisite: Statistics 7, or a basic knowledge of I. B. M. tabulating equipment.

Graduate and Advanced Undergraduate

American University will grant residence credit for any course listed below, except Course 17, 18.

9. INDEX NUMBERS AND TIME SERIES (IV, 2 cr.)—C. M. Purves; fall semester only.

10. CORRELATION ANALYSIS (IV, 2 cr.)—C. M. Purves; Wed. and Fri. 5 to 6 beginning Feb. 4. Spring semester only. \$14.

The application of advanced correlation methods to practical problems, particularly those involving time series. Mathematical and freehand multiple curvilinear correlations, logarithms, first differences, and joint correlation, applied to specific problems. Emphasis will be placed on the limitations of correlation in analyzing problems including time series, and on the tests of significance of results obtained.

Prerequisites: Statistics 3 and 4.

11, 12. GRAPHIC CORRELATION (IV)—Louis Bean; offered in alternate years; due in 1942-43.

13, 14. AGRICULTURAL STATISTICS (IV, 2 cr. each sem.)—Dr. F. M. Wadley; Fri. 4:30 to 6:30 beginning Feb. 6. Continuation of fall semester. \$14.

A nonmathematical course in the interpretation of data. Consideration for theory and previous experience, to ascertain whether and what predictions can be made regarding future data, and of actually making whatever prediction seems allowable. Testing for stability of data. Frequency distributions; the multiple histogram. Ideal sampling conditions; actual conditions. Some ideal sampling theory; single sample, several samples. The necessity for examining data in rational subgroups. Statistical stability. Scatter diagrams. Experimental design. Planning for required levels of precision. Complex experiments. Applications to economics, entomology, chemistry, toxicology, agronomy, horticulture, animal experimentation. Students' problems discussed.

Prerequisites: Mathematics 1 and 2; Statistics 3 and 4.

16. THEORY OF PROBABILITY (IV)—M. A. Girshick; offered every three years; due in 1942-43.

17, 18. ELEMENTARY STATISTICAL METHODS IN BIOLOGY AND AGRICULTURE (non-credit, correspondence course for field workers)—Dr. F. M. Wadley. Work may be commenced at any time unless the class is full; registration limited. Special fee \$15.

This course uses Snedecor's textbook **Statistical Methods**, and follows its outline largely but not absolutely. Each of the 15 lessons consists of a discussion, a textbook assignment, questions and problems. The reports are returned with corrections and comments. Subjects discussed include simple variation, regression and correlation, analysis of variance and covariance, chi-square, multiple and curvilinear correlation, applications to sampling and experimental design. Practical application of methods is kept to the front. Facility in the use of arithmetic and simple algebra is necessary. Information furnished on application.

Graduate

American University will grant residence credit for any course listed below.

20. STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (V, 2-3 cr.)—Dr. A. E. Brandt; fall, 1942-43.

21, 22. THE INTERPRETATION OF STATISTICAL CALCULATIONS (V, 2 cr. each sem.)—Alexander Sturges; Mon. 5 to 7 beginning Feb. 2. Continuation of fall semester. \$14.

Second semester: The selection and use of statistical tests. The illustrative problems will deal with single and multiple attributes. Time series will be discussed in the light of some new methods.

Prerequisites: Statistics 3 and 4, Mathematics 1 and 2.

24. *STATISTICAL FIELD STUDIES (IV, 3 cr.)—Dr. Howard B. Myers. See A. U. catalog, Stat. 418. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

25, 26. *LABOR STATISTICS (IV, 3 cr.)—Dr. Jacob Perlman. See A. U. catalog, Stat. 463. Thurs. 7:50 to 10:20. Audit \$24. Credit \$30.

28. POPULATION STATISTICS (V, 2 cr.)—Dr. Philip M. Hauser; Tues. 7 to 9 beginning Feb. 3. Offered in alternate years. \$14.

The interpretation of sample and census data on migration, employment, income, and fertility. Population trends. The calculation and interpretation of mortality and fertility rates.

Prerequisites: Mathematics 1, Statistics 3 and 4.

29, 30. ADJUSTMENT OF OBSERVATIONS (V)—Dr. W. Edwards Deming; offered every three years; due in 1943-44.

31. METHODS OF QUALITY CONTROL (V, 3 cr.)—Dr. W. Edwards Deming; offered in alternate years.

32. LEAST SQUARES (V)—Dr. W. Edwards Deming; Thurs. 7 to 10 beginning Feb. 5. Offered every three years. \$21.

Some history and review in the theory of errors. Simple problems in curve fitting. Varying weights and more complicated problems. Geometrical conditions. Adjustment of a sampled frequency table subject to known marginal totals. Curve fitting. Systematic solution; short-cuts; machine methods. The reciprocal matrix. Indeterminacy and instability. Critical discussion of sampling, statistical inference, and tests for goodness of fit. Applications. Text: Deming's Least Squares.

Prerequisites: Mathematics 3 and 4; Statistics 3, 4, 23, 24, or equivalent.

33, 34. THEORY OF SAMPLING (V)—Jerome Cornfield and W. D. Evans; offered in alternate years; due in 1942-43.

35. SAMPLING METHODS IN SOCIAL AND ECONOMIC SURVEYS (V, 3 cr.)—J. Stevens Stock and Lester R. Frankel; fall semester only.

37, 38. THEORY OF SAMPLE SURVEYS (V, 2 cr. each sem.)—Dr. William G. Madow and William Hurwitz; Wed. 7 to 9, beginning Feb. 4. Continuation of fall semester. \$14.

History of some previous sampling surveys. The types of prediction made possible by sampling to estimate characteristics of a finite set of data, and sampling to estimate characteristics of the population of which the finite set of data is a sample. The uses of statistical control in improving the quality and efficiency of the estimates. Random, stratified random, purposive, double, and systematic sampling. Cost function, choice of sampling unit, size and type of samples necessary to attain a stated degree of precision, and the distinction between precision and accuracy. The theory of probability will be developed as necessary. The contributions of Fisher, Neyman, Yates, Cochran, and others will be studied.

Prerequisites: Mathematics 3 and 4; Statistics 3 and 4.

39, 40. STATISTICAL METHODS FOR RESEARCH WORKERS (V)—Dr. William G. Madow; offered every three years; due in 1942-43.

41, 42. MULTIVARIATE ANALYSIS (V, 2 cr. each sem.)—M. A. Girshick; Mon. 5 to 7 beginning Feb. 2. Continuation of fall semester. Offered every three years. \$14.

Multivariate normal distribution; joint moments of sample variances, and covariances. Sampling from a bivariate normal population. Tests of significance; problems of estimation. Joint distribution of variance and covariance; distribution of the correlation coefficient when the population correlation is and is not zero. Least squares; classical applications; relation to maximum likelihood. Distribution of the multiple correlation coefficient.

Orthogonal polynomials. Factor analysis. Canonical correlation. Non-normal distributions. Applications.

Prerequisites: A course in advanced statistics. Mathematics 3 and 4, 19 and 20, or 5.

43, 44. THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION (V, 2 cr. each sem.)—Dr. Solomon Kullback; Fri. 7:30 to 9:30 beginning Feb. 6. Continuation of fall semester. Offered every three years. \$14.

Set functions, monotone functions, Stieltjes integrals. Random variables. The Fourier integral. Harmonic analysis. Characteristic function; moment generating properties; inversion formula, continuity property. Limit theorems. Distribution theorem for functions of random variables. Applications.

Prerequisites: Mathematics 15 and 16, or 23 and 24, and elementary and intermediate courses in statistics.

45, 46. MODERN STATISTICAL THEORIES (V, 2 cr. each sem.)—Dr. Joseph F. Daly; Tues. 8 to 10 beginning Feb. 3. Continuation of fall semester. Offered in alternate years. \$14.

Second semester: A study of papers by Neyman, Pearson, Wilks, etc. Relation of the likelihood ratio to the analysis of variance. The theory of estimation. Limitations of modern statistical tools. The necessity for studying data in rational subgroups. The contributions of Shewhart and Keynes.

Prerequisites: Mathematics 3 and 4; elementary and intermediate courses in statistics.

DEPARTMENT OF ECONOMICS AND SOCIAL SCIENCES

Departmental Committee

CHARLES F. SARLE, Ph.D., Executive Assistant for Scientific Services, Weather Bureau, Department of Commerce; formerly Director, Division of Economics, Commodity Credit Corporation (Chairman).

T. G. STUTTS, Ph.D., Chief, Cooperative Research and Service Division, Farm Credit Administration.

CARL C. TAYLOR, Ph.D., Chief, Division of Farm Population and Rural Welfare, Bureau of Agricultural Economics.

M. L. WILSON, D.Sc., Director, Extension Service, and former Under Secretary of Agriculture

MAN AND SOIL THROUGH THE AGES—Dr. Hellmut de Terra. This course is offered jointly with the Department of Physical Sciences. (See description under SPECIAL COURSES.)

ECONOMICS

Undergraduate

PRINCIPLES OF ECONOMICS (III, 3 cr. each sem.)—Dr. F. L. Thompson; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. Continuation of fall semester. \$18.

An examination of the nature, validity, and significance of the "fundamental principles of economics." Designed to give the student the understanding of basic concepts necessary for advanced study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. What we know and do not know about the nature and causes of business cycles. International economic relations. Political economic "isms." Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

COTTON CLASSING (II, 2 cr.)—R. L. Kause, in cooperation with the Cotton Division, AMS; 1942-43.

Graduate and Advanced Undergraduate

***ECONOMIC THEORY** (IV, 3 cr. each sem.)—Dr. Howard S. Pickett. See A. U. catalog, Econ. 402. Thurs. 7:50 to 10:20. Class in Agriculture Building. Continuation of fall semester. Audit \$24. Credit \$30.

This course is designed to aid in meeting the requirements of candidates for the Master's degree in economics. It follows in general outline the more advanced presentation in Contemporary Economic Thought. It is open to those who as undergraduates have had adequate preparation in economics.

HISTORY OF ECONOMIC THOUGHT (IV, 3 cr. each sem.)—Dr. Max J. Wasserman; Mon. and Wed. 5 to 6:30 beginning Feb. 2. Continuation of fall semester. \$21.

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices which conditioned them.

Prerequisite: Consent of the instructor.

***SEMINAR IN LAND ECONOMICS RESEARCH** (IV, V, 2 cr.)—Dr. V. Webster Johnson; Tues. 5 to 7 beginning Feb. 3. \$14.

Development of land economics research in the United States. Analysis of selected studies in terms of objectives, approach, methods, conclusions.

***WAGE AND HOUR REGULATION** (IV, V, 3 cr.)—Dr. David Ziskind; Wed. 7:30 to 10 beginning Feb. 4. \$21.

A study of wage and hour problems, methods of adjustment, and the administration of state and federal laws. This will include an examination of wage standards, rates, differentials, and payments; also hours, overtime, waiting time, split shifts, emergencies, holidays, and vacations. Special attention will be given problems under the Fair Labor Standards Act, the Public Contracts Act, and the Davis-Bacon Act.

***THE INDIVIDUAL WORKER AND THE LAW** (IV, V, 3 cr.)—Dr. David Ziskind; Mon. 7:30 to 10 beginning Feb. 2. \$21.

The progress of social legislation designed to improve labor standards. Legislation on child and woman labor, safety and health, accident compensation, wage payment and collection, minimum wages, unemployment insurance, and old age pensions. The administrative procedures before such agencies as the National Labor Relations Board, the Social Security Board, the National Mediation Board, the Division of Public Contracts, the Fair Labor Standards Division, and the various State labor departments.

ECONOMIC DEFENSE AND WARFARE (IV, 3 cr.)—Dr. Max J. Wasserman; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. \$21.

This study of modern economic warfare will begin with an analysis of the circumstances which led to the present conflict; study in some detail the economic organization, defense and attack methods of the belligerents and their collaborators; examine the post-defense plans for a durable peace. Lectures, class discussion, readings in a selected bibliography of the modern literature on the subjects.

***MONEY AND BANKING** (IV, 3 cr.)—Homer Jones. See A.U. catalog, Econ. 410. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.

***ECONOMIC GEOGRAPHY AND TRANSPORTATION OF LATIN AMERICA** (IV, 3 cr.)—Dr. M. J. Proudfoot. See A.U. catalog, Econ. 469. Wed. 7:50 to 10:20. Audit \$24. Credit \$30.

***LABOR AND THE PUBLIC INTEREST** (IV, 3 cr.)—Dr. Gustav Peck. See A.U. catalog, Econ. 441. Wed. 5:15 to 7:45. Audit \$24. Credit \$30.

***AGRICULTURAL ECONOMICS** (IV, 3 cr.)—Dr. O. C. Stine. See A.U. catalog, Econ. 461. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

***T. N. E. C. INQUIRY** (IV, 3 cr.)—Dr. William H. S. Stevens. See A.U. catalog, Econ. 493. Mon. 5:15 to 7:45. Audit \$24. Credit \$30.

***CURRENT ISSUES IN TRANSPORTATION** (IV, 3 cr.)—Dr. Ludwig Homberger. See A.U. catalog, Econ. 456. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

***GOVERNMENT CONTROL OF ECONOMIC LIFE** (IV, 3 cr.)—Dr. R. A. Clemen. See A.U. catalog, Econ. 491. Wed. 5:15 to 7:45. Audit \$24. Credit \$30.

***TECHNOLOGY AND MODERN ECONOMIC PROBLEMS** (IV, 3 cr.)—Dr. R. A. Clemen. See A.U. catalog, Econ. 405. Tues. 5:15 to 7:45. Audit \$24. Credit \$30.

To Be Offered in 1942-43

***PRODUCTION ECONOMICS** (IV, V, 3 cr.)—Dr. Sherman E. Johnson and Dr. Wylie E. Goodsell.

***FARM MANAGEMENT** (IV, V, 3 cr.)—Dr. Sherman E. Johnson and Dr. Wylie E. Goodsell.

***SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE** (IV, V, 2 cr. each sem.)—Everett E. Edwards.

***ECONOMICS OF INTERNATIONAL TRADE** (IV, V, 3 cr.)—Robert B. Schwenger.

***PRINCIPLES OF AGRICULTURAL FINANCE** (IV, V, 3 cr.)—Dr. Fred L. Garlock and Dr. Donald C. Horton.

- *PRINCIPLES OF INSURANCE (IV, V, 3 cr.)—Dr. Allan J. Fisher.
- *COTTON MARKETING (IV, V, 3 cr.)—Dr. John W. Wright and specialists.
- *ORGANIZED LABOR AND THE LAW (IV, V, 3 cr.)—Dr. David Ziskind.
- *SEMINAR: THE ECONOMIES OF THE NATIONS OF LATIN AMERICA (IV, V, 4 cr.)—Dr. Charles F. Sarle.
- *LAND ECONOMICS (IV, V, 2 cr.)—Dr. V. Webster Johnson.

Graduate

*CONTEMPORARY ECONOMIC THOUGHT (Advanced Economic Theory) (V, 3 cr. each sem.)—Dr. Howard S. Piquet. See A.U. catalog, Econ 502. Thurs. 5:15 to 7:45. Audit \$24. Credit \$30.

*ECONOMICS OF CONSUMPTION (V, 3 cr.)—Dr. Michael T. Wermel; Mon. and Wed. 5:30 to 7 beginning Feb. 2. \$21.

A study of consumer demand and its special significance to economic theory. This course will offer a comprehensive analysis of economic demand—the factors determining consumer choices. The various planes of consumption; standards of living, etc. Analyses of commercial, professional, and governmental agencies affecting the consumer and his choices. Organization of consumers. Analysis of the legal position of the consumer. The protection of the consumer. Particular attention will be paid to the significance of consumer choice and consumer standards of living to agriculture.

*ECONOMICS OF IMPERFECT COMPETITION (V, 3 cr. each sem.)—Dr. Michael T. Wermel; Mon. and Wed. 7:30 to 9 beginning Feb. 2. Continuation of fall semester. \$21.

The usefulness and applicability of the theoretical apparatus developed in the first semester will be tested by a study of actual institutional practices, of price determination in specific markets in industries such as rubber tires, agricultural implements, drugs, meat packing, fertilizer, canning, etc., where admittedly neither "perfect competition" nor "pure monopoly" prevails.

ECONOMIC PROBLEMS OF THE POSTWAR WORLD — INTERNATIONAL PROBLEMS (V, 3 cr.)—Robert B. Schwenger and Dr. Montell Ogdon; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. \$21.

A review of the theory of international trade in the light of both recent economic theories and the problems of postwar economic reconstruction; specific postwar international problems of food and raw material supply, nutritive and other consumer requirements of nations, the coordination of production and employment, trade barriers, currency and exchange arrangements, international loans, and commodity agreements. Attention will be paid to the significance of alternative commercial policies for both world and domestic economic programs and to the impact of methods of international cooperation on economic problems.

Prerequisites: One year full-time graduate study in economics or international relations.

*AGRICULTURAL PRICE ANALYSIS (V, 3 cr.)—Dr. F. L. Thomsen; Mon. and Wed. 5 to 6:30, beginning Feb. 2. \$21.

A review of the supply and demand factors affecting agricultural prices. Time elements in prices. Research methods and materials in price analysis. Index numbers. Uses and limitations of multiple correlation in price analysis. Seasonal variation. Trends and cycles. A critical evaluation of progress to date in price analysis. Price forecasting. Chart reading. The use of analytical devices in throwing light upon the probable effects of agricultural legislation designed to influence farm prices and income, and in promoting the successful administration of such measures.

*SEMINAR: ECONOMIC PROBLEMS OF THE POSTWAR WORLD—DOMESTIC PROBLEMS (V, 3 cr.)—Dr. Mordecai Ezekiel and Robert B. Schwenger; fall, 1942-43.

*THEORY AND PRINCIPLES OF AGRICULTURAL MARKETING (V, 2 cr. each sem.)—Dr. F. V. Waugh, Dr. A. C. Hoffman and R. O. Been; 1942-43.

*FORECASTING DEMAND FOR AGRICULTURAL PRODUCTS (V, 3 cr.)—Dr. F. L. Thomsen; fall, 1942-43.

*ANALYSIS OF METHODS OF ECONOMIC REASONING (V, 3 cr.)—Dr. Karl Pribram. See A.U. catalog, Econ. 602. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.

*UNITED STATES WAR-TIME MONETARY AND BANKING PROBLEMS (V, 3 cr.)—Dr. Fritz Karl Mann. See A.U. catalog, Econ. 512. Wed. 5:15 to 7:45. Audit \$24. Credit \$30.

HISTORY Undergraduate

HISTORY OF THE UNITED STATES (I, II, 2 cr. each sem.)—Dr. W. M. Gewehr; 1942-43.

Graduate and Advanced Undergraduate

UNITED STATES IN THE TWENTIETH CENTURY (III, IV, 2 cr.)—Dr. W. M. Gewehr; Tues. 5 to 7 beginning Feb. 3. \$12.

A consideration of the important political, economic, and social changes of the last fifty years. Among the topics to be studied are conditions at the turn of the century; the rise of American imperialism; big business and politics; the progressive movement and liberal reform; America and the first World War; the return to "normalcy"; the second Roosevelt's New Deal; the United States in world affairs today.

WORLD POLITICS (III, IV, 2 cr.)—Dr. W. M. Gewehr; fall, 1942-43.

LATIN AMERICAN HISTORY (IV, V, 2 cr. each sem.)—Dr. Ernesto Galarza; 1942-43.

SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (IV, V, 2 cr. each sem.)—Everett E. Edwards; 1942-43.

***DEVELOPMENT OF AMERICAN CULTURE (IV, 3 cr.)—Dr. Caroline F. Ware. See A.U. catalog, Hist. 407. Wed. 7:50 to 10:20. Audit \$24. Credit \$30.**

POLITICAL SCIENCE

Graduate and Advanced Undergraduate

POLITICS AND CULTURE OF THE FAR EAST (III, 2 cr.)—Dr. W. M. Gewehr; Thurs. 5 to 7 beginning Feb. 5. \$12.

The purpose of this course will be to give the student some understanding and appreciation of the civilization and cultures of China and Japan particularly and their significant role in international affairs. Emphasis will be placed upon the modern and contemporary periods.

LA AMERICA LATINA Y LOS ESTADOS UNIDOS (IV, V, 2 cr. each sem.)—Philip Leonard Green; Mon. 5 to 7 beginning Feb. 9. Lectures and discussions in Spanish. \$14.

This course, open to students sufficiently advanced in Spanish to follow lectures in that language, aims to provide an opportunity to achieve greater facility in Spanish while acquiring useful and interesting information on Latin America and its relations with us. The second semester covers main trends in the development of inter-American relations from colonial times to the present. It describes both official and private Pan American activities. It points out factors militating for and against inter-American amity and presents some problems and opportunities facing the Americas today.

***LATIN AMERICA IN THE TWENTIETH CENTURY (IV, 3 cr.)—Dr. John C. Patterson. See A.U. catalog, Int. Af. 452. Mon. 5:15 to 7:45. Audit \$24. Credit \$30.**

***GROWTH OF POLITICAL THOUGHT (IV, 3 cr.)—Dr. James J. Robbins. See A.U. catalog, P. S. 410. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.**

PUBLIC LAW

Graduate and Advanced Undergraduate

***AGRICULTURE AND PUBLIC LAW (IV, V, 2 cr.)—Philip M. Glick. (See PUBLIC ADMINISTRATION).**

***ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (See ACCOUNTING).**

***BUSINESS LAW (IV, V, 3 cr. each sem.)—Walter H. Young. See A.U. catalog, Econ. 484. Tues. 7:50 to 10:20. Audit \$24. Credit \$30.**

***THE INDIVIDUAL WORKER AND THE LAW (See ECONOMICS).**

SOCIOLOGY

Graduate and Advanced Undergraduate

***THE EVOLUTION OF AMERICAN RURAL LIFE (IV, V, 3 cr.)—Dr. Carl C. Taylor, Dr. John Provinse, and Dr. Paul Johnstone; fall, 1942-43.**

*CULTURAL REGIONS OF THE UNITED STATES (IV, V, 3 cr.)—Dr. Carl C. Taylor, Dr. John Provinse, and Dr. Paul Johnstone; spring, 1942-43.

*SEMINAR IN POPULATION PROBLEMS (IV, V, 3 cr.)—Dr. Conrad Taeuber; 1943-44.

RURAL POPULATION TRENDS IN THE UNITED STATES (IV, V, 3 cr.)—Dr. Conrad Taeuber; 1942-43.

*RURAL COMMUNITY ORGANIZATION (IV, V, 2 cr.)—Dr. Charles P. Loomis and Dr. Douglas Ensminger; fall, 1942-43.

*SEMINAR IN COMMUNITY ORGANIZATION (V, 3 cr.)—Dr. Douglas Ensminger; time to be arranged at first meeting, Mon., Feb. 2, at 5 o'clock. \$21.

This seminar will be conducted as a clinic in community and leadership problems.

*SOCIAL PSYCHOLOGY (IV, V, 2 cr.)—Dr. Raymond F. Sletto and Dr. Carl C. Taylor; fall, 1942-43.

*RURAL SOCIAL PSYCHOLOGY (V, 2-3 cr.)—Dr. Carl C. Taylor; Mon. 5 to 7 beginning Feb 2. \$14.

An analysis of the social psychology of rural people and groups. Attention will be given to: attitudes of rural people toward rural life, urban life, social and technological change; the phenomena of lags in social and cultural change and the reign of customs, traditions and folkways; effective techniques for securing participation of farmers in community, State and National programs. An analysis of the farmer's movement, farm pressure groups and rural public opinion will be discussed.

Prerequisites: One course in social psychology, or one course in sociology and one course in psychology.

HISTORY OF SOCIAL THEORY (IV, V, 3 cr.); 1942-43.

FARM TENANCY (IV, V, 3 cr.)—Dr. William T. Ham and Marshall Harris.

RURAL SOCIAL PROBLEMS (IV, 3 cr.)—Dr. Olaf F. Larson; Mon. 5 to 7 beginning Feb. 2. \$12.

A study of disadvantaged groups in American agriculture and pathological situations in rural areas; historical background of such groups and situations and the social processes whereby they developed. Class structure in rural society. Rural problem areas. Emphasis will be placed on an analysis of low income and dependent groups and programs of relief and rehabilitation.

SOCIAL PLANNING IN AGRICULTURE (V, 3 cr.); 1942-43.

MINORITY GROUPS (V, 3 cr.); 1942-43.

*POPULATION POLICIES (IV, 3 cr.)—Dr. Frank Lorimer. See A. U. catalog, Soc. Ec. 511. Mon. 7:50 to 10:20. Audit \$24. Credit \$30.

*PUBLIC OPINION AND PROPAGANDA (IV, 3 cr.)—Dr. Catheryn Seckler-Hudson. See A. U. Catalog, P.A. & P.S. 419. Tues. 5:15 to 7:45. Audit \$24. Credit \$30.

DEPARTMENT OF PUBLIC ADMINISTRATION

Departmental Committee

LEON O. WOLCOTT, Ph.B., LL.B., Special Assistant, Surplus Marketing Administration, and former Assistant to Secretary Henry A. Wallace (Chairman)

JOHN R. FLEMING, B.S., Special Assistant to the Chief, Bureau of Agricultural Economics

PETER KELINGER, M.S.F., Staff Assistant in Administrative Management, Forest Service

VERNE B. LEWIS, B.Ed., Budget and Planning Officer, Division of Foreign Funds, Treasury Department

JOHN THURSTON, Ph.D., Organization and Management Analyst, Office of Personnel

Graduate and Advanced Undergraduate

INTRODUCTION TO PUBLIC ADMINISTRATION (III, 3 cr.)—Erwin C. Hannum; Wed. and Fri. 5 to 6:30 beginning Feb. 4. \$18.

This course is designed to introduce the student to the elements of public administration. Attention will be devoted to the evolution of administrative organization; organizational types; staff, line, and auxiliary agencies and functions; controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; budgeting and fiscal control; federal-state relations; administrative legislation and adjudication. The object of the course is to lay a broad foundation for more intensive courses in management.

SCIENTIFIC MANAGEMENT (IV, V, 1 cr.)—Dr. Harlow S. Person;
fall, 1942-43.

ADMINISTRATIVE ORGANIZATION (IV, V, 2 cr.)—Dr. Marshall Dimock; deferred on account of war.

***RELATIONS BETWEEN FEDERAL, STATE, AND LOCAL GOVERNMENTS (IV, 3 cr.)—Dr. Hiram M. Stout. See A. U. catalog.
P.A. & P.S. 404. Wed. 7:50 to 10:20. Audit \$24. Credit \$30.**

**PUBLIC ADMINISTRATION AND THE UNITED STATES DEPARTMENT OF AGRICULTURE (III, IV, 2 cr.)—Leon O. Wolcott;
Tues. 5 to 7 beginning Feb. 3. \$12.**

Within the framework of the Department of Agriculture, its origin, evolution and present organization, this course will view the broad aspects of public administration. Attention will be given to the impact of national, international, economic, political, ecological, and other forces, trends and influences, upon public administration, particularly with respect to this Department.

***AGRICULTURE AND PUBLIC LAW (IV, V, 2 cr.)—Philip M. Glick;
Wed. 5 to 7 beginning Feb. 4. \$14.**

This course will consider the ways in which legal institutions and doctrines—among them, Federalism, constitutionalism, administrative action, judicial review, police power, due process, equal protection of law, separation of powers, and legislative certainty—mold agricultural legislation and programs. Particular attention will be given to the law relating to land use, water use, production control, planning, agricultural education, rural rehabilitation, and conservation of natural resources. A later course will deal similarly with marketing and credit programs. Intended primarily for non-lawyers.

**ADMINISTRATIVE LAW AND PROCEDURE (IV, V, 2 cr. each sem.)—
Dr. Ashley Sellers; fall, 1942-43.**

FEDERAL-STATE COLLABORATION—1942-43.

**PRINCIPLES OF SUPERVISION (IV, 2 cr.)—Henry H. Farquhar; fall,
1942-43.**

**ADVANCED SUPERVISION (IV, V, 2 cr.)—Henry H. Farquhar; Fri.
5 to 7 beginning Feb. 6. \$14.**

This course will deal primarily with the selection of supervisors, the testing of the adequacy of current supervisory practices, and the training of subordinate supervisors in better supervisory methods. It will be based on the study of actual problems and situations, for which students will have an opportunity to draw upon their experience in finding solutions conducive to high morale and satisfactory performance. Special emphasis will be placed on tangible aids to good supervision, including procedural analysis, standards and measurement of performance, planning and scheduling work, supervisory control through operating budgets, and organization structure.

Prerequisite: Principles of Supervision; experience in directing the work of others; or consent of instructor.

PERSONNEL ADMINISTRATION

Graduate and Advanced Undergraduate

**PERSONNEL ADMINISTRATION (III, IV, 2 cr.)—Maxwell A. DeVoe;
fall, 1942-43.**

SEMINAR IN PERSONNEL ADMINISTRATION—Postponed to 1942-43.

**POSITION CLASSIFICATION (IV, 2 cr.)—Dr. O. Glenn Stahl; Wed.
5 to 7 beginning Feb. 4. \$14.**

This is an introductory course designed to give the student an understanding of the fundamental concepts of position classification and its uses; the relation of classification to compensation and other phases of personnel administration; the historical background of position classification in the Federal Service; an analysis of the Classification Act of 1923 and its amendments and its relation to other personnel processes; position analysis and factors to be considered in the allocation of positions.

**ADVANCED POSITION CLASSIFICATION (IV, V, 2 cr.)—James L.
Buckley; Mon. 5 to 7 beginning Feb. 2. \$14.**

A detailed study of federal position classification based primarily on specific cases. Emphasis will be placed on factors that enter into the allocation of positions and the application of such factors in actual and hypothetical classification situations.

Prerequisite: Position Classification or equivalent.

***COUNSELING GOVERNMENT EMPLOYEES (IV, 3 cr.)—Samuel S.
Board; fall, 1942-43.**

***SELECTION AND PLACEMENT (IV, 3 cr.)—Samuel S. Board; Wed.
5 to 8 beginning Feb. 4. \$21.**

The study of recruiting, examination, and certification of employees of the federal government with special reference to comparable

practices in private business and other government organizations. Placement activities carried on by the agencies themselves, such as interviewing, personnel inquiries, transfers, promotions, and the better use of probationary period.

FINANCIAL ADMINISTRATION

Graduate and Advanced Undergraduate

BUDGETARY AND FINANCIAL ADMINISTRATION: BUDGET FORMULATION (IV, V, 2 cr.)—W. A. Jump and other specialists; fall, 1942-43.

BUDGETARY AND FINANCIAL ADMINISTRATION: BUDGET EXECUTION (IV, V, 2 cr.)—W. A. Jump and other specialists; Thurs. 5 to 7 beginning Feb. 5. \$14.

This is the second part of an advanced two-semester course covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureaus and department budget offices, and other budgetary and financial organizations will lecture and lead discussions.

The following committee will assist Mr. Jump in planning and giving the course: Gerald G. Smith, Chief, Budget and Finance Division, Soil Conservation Service; W. J. Snow, Jr., Director of Finance and Accounts, Farm Credit Administration; Edmund Stephens, Budget Officer, Bureau of Plant Industry; Henry Wold, Budget Officer, Forest Service; Richard W. Maycock, Chief, Division of Estimates and Allotments, Office of Budget and Finance; and Joseph C. Wheeler, Administrative Officer, Office of Budget and Finance.

This semester deals with the execution of the budget after being enacted by Congress and the relationships of administrative planning and control, accounting, auditing, and financial reporting to budget execution.

Prerequisites: Experience in budgetary or financial administration; courses in government or public administration; or consent of instructor.

GOVERNMENTAL PURCHASING (IV, V, 2 cr.)—Samuel A. Snyder and Dr. J. B. Westcott; Wed. 5 to 7 beginning Feb. 4. \$14.

The purpose of this course is to survey the various aspects of governmental purchasing. Among the topics to be considered are: the development of governmental purchasing, organization and management, public contracts, standardization, specification writing, market analysis, national defense and public procurement, and public relations. The course will be conducted primarily on a round-table basis, with specialists leading the discussion of the different phases of procurement.

PURCHASING PROCEDURE—an elementary course confined to procedural aspects of purchasing; offered in fall semester in Department of Office Skills.

ACCOUNTING

Undergraduate

PRINCIPLES OF ACCOUNTING (II, 3 cr. each sem.)—William H. Rowe, Dr. Oswald Nielsen, John F. McShea, Dr. V. W. Bennett, and G. Y. Jarvis. \$18. A two-hour LABORATORY PERIOD once a week is required unless specially excused by the instructor.

First semester work. Tues. and Thurs. 5 to 6 beginning Feb. 3. Laboratory, Thurs. 6 to 8 beginning Feb. 5. If enough persons register for two sections, the second section will be given Mon. and Wed. at 5:30 beginning Feb. 2. Laboratory Wed. 6:30 to 8:30 beginning Feb. 4.

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to devise the accounting methods necessary for a small business organization, make the necessary entries in the records, draw up statements at the end of the fiscal year, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester work.

Sec. I—Tues. and Thurs. 5 to 6 beginning Feb. 3. Laboratory, Tues. 6 to 8 beginning Feb. 10.

Sec. II—Mon. and Wed. 5:30 to 6:30 beginning Feb. 2. Laboratory, Mon. 6:30 to 8:30 beginning Feb. 9.

Continuation of first semester covering the more advanced principles of accounting; account classifications; the valuation of assets and depreciation policies; manufacturing accounts; partnership accounts; and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

Graduate and Advanced Undergraduate

SECOND YEAR ACCOUNTING (III, 3 cr. each sem.)—Dr. Oswald Nielsen; Fri. 5 to 8 beginning Feb. 6. Continuation of fall semester. \$18.

Valuation, asset values, liabilities and net worth, allocation of income, and expense to proper fiscal period as part of problem

of valuation, deferring expenses and treatment of unusual losses and gains, profits and dividends and the relationship of funds to reserves.

Prerequisite: First year accounting or equivalent.

GOVERNMENTAL ACCOUNTING (IV, 3 cr.)—H. F. Shambarger and other specialists; Wed. 5 to 8 beginning Feb. 4. \$21.

A detailed and basic study of appropriation and fund accounting including the action by the administrative agencies. The Treasury and the General Accounting Office. Special emphasis will be given to the Summary System of Accounts prescribed by Executive Order No. 8512 and the manner in which the administrative agencies will be affected by them. The relationship between governmental accounting and budgetary control will be discussed. Specialists in their respective fields will assist in the course by covering certain phases. The specialists include W. R. Fuchs, Assistant Director of Finance, Department of Agriculture; Jay L. Chambers, Assistant to Commissioner of Accounts, Treasury Department; and J. J. Somers, Assistant to Director of Finance, Department of Agriculture.

Prerequisite: Experience in accounting or budgetary work, or one year of accounting, or consent of instructor.

AUDITING (IV, V, 2 cr.)—John J. Bachmann; Mon. 5 to 7 beginning Feb. 2. \$14.

The purposes and types of audits will be studied. Consideration will be given to such problems as the planning and performing of audits, principles and auditing of different types of audits, audit working papers and reports, and responsibility of the auditor.

Prerequisite: Second year accounting.

AUDITING PROCEDURE (See OFFICE SKILLS).

***ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (V, 2 cr. each sem.)—Dr. Mark S. Massel; Thurs. 5 to 7 beginning Feb. 5. Continuation of fall semester. \$14.**

This course is designed to present significant accounting concepts in the field of legal problems. It will include a general exposition of accounting methods in correlation with pertinent legislation, administrative rulings, and case material. The purposive character of accounting will be treated in terms of: balance sheets, assets, liabilities, capital, income, profit and loss statements, reserves, and deferred assets. The various types of accounts will be analyzed as problems in accounting methods and in various legal fields such as stockholders' suits, income bonds, patent suits, income taxes, property taxes, fraud, estates, public utility regulation and reorganizations. Differences in the interpretation of accounts in the various legal fields will be stressed.

COST ACCOUNTING (IV, V, 3 cr.)—fall, 1941-42.

***MATHEMATICS OF FINANCE (IV, V, 3 cr.)—William H. Rowe; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. \$21.**

Calculation of compound interest, compound discount, sum of annuities, present value of annuities and perpetuities; determination of annual payments necessary to accumulate sinking funds and to amortize debts to installments and preparation of schedules for such accumulations and amortizations. The valuation of bonds in cases where the yield rate differs from the bond rate and the preparation of schedules for the amortization of premiums or accumulations of discounts on such bonds. Computation of depreciation by the sinking fund method, the fixed percentage of book value method, and other methods, as well as the preparation of schedules for the same will be included. Some study will be given to life probabilities, and the computation of premiums for the simpler types of life annuities and life insurance. Problems will include those of type given in C.P.A. examinations.

Prerequisite: Algebra and preferably one year of accounting.

DEPARTMENT OF LANGUAGE AIDS

Departmental Committee

HARRY B. HUMPHREY, Ph.D., Principal Pathologist, Bureau of Plant Industry, and Editor, *Phytopathology* (Chairman)

J. L. APODOCA, M.B.A., Senior Agricultural Economist, Office of Foreign Agricultural Relations

M. C. MERRILL, Ph.D., Chief, Division of Publications, Office of Information

RALPH R. SHAW, M.S., Department Librarian

ENGLISH

Undergraduate

COMPOSITION AND RHETORIC (I, 2 cr.)—Dr. Susan E. Harman; Thurs. 5 to 7 beginning Feb. 5. \$12.

Equivalent of first-quarter freshman English. An introductory course in writing and English usage, designed especially for those

who need a course preparatory to more advanced English courses. Special attention will be given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, etc.

DESCRIPTIVE ENGLISH GRAMMAR (III, 2 cr.)—Dr. Susan E. Harriman; Mon. 5 to 7 beginning Feb. 2. \$12.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

LITERATURE

Advanced Undergraduate

INTRODUCTION TO SPANISH AMERICAN LITERATURE (III, IV, 2 cr.)—Dr. Madeline W. Nichols; fall, 1942-43.

THE CLASSICS (See SPECIAL COURSES)

SPEECH

Undergraduate

FUNDAMENTALS OF SPEECH (I, 2 cr.)—Hester Beall Provensen; Tues. 5 to 7 beginning Feb. 3. \$12.

A course to develop in the speaker the ability to communicate his ideas readily and effectively through the study of audience analysis, distinct utterance, outlining, word usage, enrichment of vocabulary, and voice production. Ample opportunity to speak. Individual criticism.

EFFECTIVE SPEAKING (II, 2 cr.)—Hester Beall Provensen; Thurs. 5 to 7 beginning Feb. 5. \$12.

Clear, forceful, and convincing expression is the result of directed practice in a variety of speech situations. Hence, this course will concentrate on preparation and practice in public speaking and the speech arts. Speeches for special occasions, description, exposition, radio speaking, story telling, and training in the art of conversation. The emphasis is on practice; knowledge of speech fundamentals is presupposed.

PERSUASIVE AND ARGUMENTATIVE SPEAKING (II, 2 cr. each sem.)

—Dr. C. H. McReynolds; Mon. 5 to 7 beginning Feb. 2.
New students admitted. \$12.

Emphasis will be placed on psychology of the audience—kinds of audiences, basic desires, habit, psychological mechanics, variety. Speech construction—the brief, evidence, authority, reason, psychology. Application of these principles in speeches, round-table discussions, and parliamentary speaking.

PERSONAL DEVELOPMENT (non-credit)—Hester Beall Provensen; Wed. 5 to 7 beginning Feb. 4. \$12.

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, cultivation of wider range of interest, and curiosity. Actual social situations created and discussed. Conferences, guest speakers.

WRITING AND EDITING

Graduate and Advanced Undergraduate

CREATIVE WRITING (III, 2 cr.)—DeWitt C. Wing; Thurs. 5 to 7 beginning Feb. 5. \$12.

This course is designed primarily to develop the student's inclinations in literary work through guidance, example, and practice. Emphasis is laid on facility of expression, skill in the use of words, and familiarity with the current media for reaching the reading public. The course presupposes a fundamental knowledge of composition.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (IV, 3 cr.)—Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information; fall, 1942-43.

WRITING SPECIAL REPORTS (IV, 2 cr.)—Alfred D. Stefferud; fall, 1942-43.

FOREIGN LANGUAGES

The hours of class meeting scheduled for the language courses usually represent three credits. Students who register for two credits will meet for correspondingly shorter periods.

ELEMENTARY FRENCH (I, II, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Mon. and Wed. 5 to 6:30 beginning Feb. 2. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr. Instruction in elements of French grammar. Reading and trans-

lation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced courses in French.

ADVANCED FRENCH (III, IV, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Tues. and Thurs. 5 to 6:30 beginning Feb. 3. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr.

CONVERSATIONAL FRENCH (non-credit)—Mary Sabath; Wed. 5 to 7 beginning Feb. 4. New students admitted. \$12.

This course is designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business dealings. Students will meet in sections formed on the basis of background in French grammar.

ELEMENTARY GERMAN (I, II, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Mon. 5 to 8 beginning Feb. 2. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr.

Instruction in elements of German grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in German.

ADVANCED AND TECHNICAL GERMAN (III, IV, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Fri. 5 to 8 beginning Feb. 6. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr.

GERMAN TRANSLATION (III, IV, 1½ cr. each sem.)—Ira T. Braunestein; Wed. 5 to 6:30 beginning Feb. 4. Continuation of fall semester. \$9.

Translation from German into English and English into German, including idiomatic German. The course will also be helpful to graduate students who intend to take reading examinations for advanced degrees.

FIRST SEMESTER SPANISH (I, II)—Dr. Madaline W. Nichols, Olivia Russell, Dr. Manuel de J. Sainz, Edmundo Lassalle, and Raphael de Haro. Each section limited to 30.

Sec. I, (3 cr.)—Tues. 5 to 8 beginning Feb. 3. \$18.

Sec. II (2 cr.)—Tues. 7 to 9 beginning Feb. 3. \$12.

Sec. III (2 cr.)—Wed. 5 to 7 beginning Feb. 4. \$12.

Sec. IV (3 cr.)—Thurs. 7 to 10 beginning Feb. 5. \$18.

Sec. V (2 cr.)—Wed. 5 to 7 beginning Feb. 4 in Longfellow Building, 1201 Conn. Ave., N. W. \$12. (de Haro)

Pronunciation, the use of idioms, building vocabulary, elements of grammar, simple conversation, and reading.

SECOND SEMESTER SPANISH (I, II)—\$12 for 2 cr. \$18 for 3 cr.

Sec. I (2-3 cr.)—Ruberta M. Olds; Mon. 5 to 8 beginning Feb. 2.

Sec. II (2-3 cr.)—Dr. Madaline W. Nichols; Tues. 7 to 10 beginning Feb. 3.

Sec. III (3 cr.)—Raphael de Haro; Mon. 5 to 8 beginning Feb. 2 in Longfellow Building, 1201 Conn. Ave., N. W.

Continuation of first semester work. This course was formerly called Intermediate Spanish.

THIRD SEMESTER SPANISH (II, 2-3 cr.)—Ruberta M. Olds; Wed. 5 to 8 beginning Feb. 4. \$12 for 2 cr. \$18 for 3 cr.

Short grammar review with practice in translations in Spanish and English, some free composition, conversation, intensive and extensive reading.

FOURTH SEMESTER SPANISH (II, 2-3 cr.)—Ruberta M. Olds; Tues 5 to 8 beginning Feb. 3. \$12 for 2 cr. \$18 for 3 cr.

SPANISH CONVERSATION AND COMPOSITION (III, 2 cr. each sem.)—Edmundo Lassalle; Thurs. 5 to 7 beginning Feb. 5. Continuation of fall semester. \$12.

A course designed to develop ability to understand and to converse in idiomatic Spanish, to translate articles in newspapers and magazines, to compose and translate social letters; free composition.

Prerequisite: Two years of Spanish or equivalent.

COMMERCIAL SPANISH (III, 2 cr. each sem.)—Dr. Manuel de J. Sainz; Wed. 5 to 7 beginning Feb. 4. New students admitted. \$12.

A course in commercial Spanish correspondence which includes building of appropriate vocabulary by study of forms, reading, and translations of letters. Much practice using natural idiomatic expressions in both Spanish and English letters.

LA AMERICA LATINA Y LOS ESTADOS UNIDOS (See POLITICAL SCIENCE).

FIRST SEMESTER PORTUGUESE (I, II, 3 cr.)—Dr. Raul d'Eca; Tues. 7 to 10 beginning Feb. 3. \$18.

The fundamentals of the language, elements of grammar, pronunciation, reading and translation of elementary materials.

SECOND SEMESTER PORTUGUESE (I, II, 3 cr.)—Dr. Raul d'Eca;
Tues. and Thurs. 5 to 6:30 beginning Feb. 3. \$18.

Continuation of study of the fundamentals of the language, elementary of grammar, pronunciation, reading and translation of elementary materials.

ELEMENTARY ITALIAN (I, II, 2-3 cr. each sem.)—Dr. Nicholas G. Barbella; Thurs. 5 to 8 beginning Feb. 5. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr.

The fundamentals of the language, with practice in conversation. Texas; Joseph L. Russo, *Elementary Italian Grammar*; Marro, *Contemporary Italian Short Stories*.

ADVANCED ITALIAN (III, 2-3 cr. each sem.)—Dr. Nicholas G. Barbella; fall 1942-43.

ELEMENTARY RUSSIAN (I, II, 2-3 cr. each sem.)—George M. Saharov; Wed. 5 to 8 beginning Feb. 4. Continuation of fall semester. \$12 for 2 cr. \$18 for 3 cr.

The fundamentals of the language for beginning students of Russian.

DEPARTMENT OF ENGINEERING AND MECHANICAL ARTS

Departmental Committee

FRANCIS J. SETTE, M.S., Deputy Administrator, Rural Electrification Administration (Chairman)

REGINALD G. HAINSWORTH, M.A., Head, Graphic Section, Bureau of Agricultural Economics

T. W. NORCROSS, M.S., Chief, Division of Engineering, Forest Service

J. A. SCOTT, C.E., Chief, Division of Plans and Service, Bureau of Agricultural Chemistry and Engineering

ROY STRYKER, A.B., Chief, Historical Section, Division of Information, Farm Security Administration

ENGINEERING

Graduate and Advanced Undergraduate

WATER POWER ENGINEERING (See UTILITY ADMINISTRATION AND REGULATION).

ELECTRIC UTILITY ENGINEERING (See UTILITY ADMINISTRATION AND REGULATION).

NAVAL ARCHITECTURE (IV, 2 cr. each sem.)—Charles L. Wright, Jr.; Tues. 7 to 9 beginning Feb. 3. \$14.

Second semester: Trochoidal wave theory; action of ships in waves; hull form and resistance; power; propulsion, steering.

SHIP CONSTRUCTION (IV, 2 cr. each sem.)—Charles L. Wright, Jr.; Thurs. 7 to 9 beginning Feb. 5. New students admitted. \$14.

Second semester: Arrangement of machinery and fittings; piping, wiring, and ventilation; load line regulations, tonnage measurement, trial trips, dry docks.

FUNDAMENTAL AERODYNAMICS (III, 2 cr.)—W. E. Koneczny; Mon. 5 to 7 beginning Feb. 2. \$12.

Fluid flow, wing theory, airfoil characteristics, wind tunnel tests, high lift devices, proportioning of aircraft, static and dynamic stability, and powerplant considerations. Lectures, discussions, and problems.

AIRPLANE STRESS ANALYSIS (III, 2 cr.)—W. E. Koneczny; Wed. 5 to 7 beginning Feb. 3. \$12.

This course will acquaint the student with the various parts of airplane structures and the means used for their analysis. A review of basic strength of materials, applied loads on an airplane, wings, fuselage, tail surfaces, landing gear, controls, fittings, standard methods of analysis, and static tests. Lectures, discussions, and problems.

AIRCRAFT ENGINES AND INSTALLATION (III, 2 cr.)—A. N. Troshkin; Fri. 5 to 7 beginning Feb. 6. \$12.

Internal combustion engine principles, modern aircraft engines, general design features, carburetion, induction and exhaust systems, ignition, generators, starters, fuel systems and installation, lubrication and lubricating systems, engine installation and cooling accessories, engine testing, and powerplant performance.

Prerequisites: Preferably some training in engineering mathematics, mechanics and structures.

ADVANCED PHYSICAL METALLURGY—(See PHYSICAL SCIENCES).

ANALYTICAL MECHANICS—(See MATHEMATICS).

GLASS BLOWING

GLASS BLOWING (2 cr. each sem.)—Leland B. Clark; Mon. and Wed. 4:30 to 6 beginning Feb. 2, in the basement of the Smithsonian Institution. Continuation of fall semester. Registration limited to ten students. Special fee \$18, including materials.

This is a laboratory course for technicians. Simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the soft glasses were utilized for practice; during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

GRAPHIC PRESENTATION

Undergraduate

Architectural and Mechanical Drawing have a two-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors in the architectural and mechanical fields.

Prerequisites: Fifteen standard high school units or equivalent.

ARCHITECTURAL DRAWING (I, II, 2 cr. each sem.)—G. L. Edick; Tues. and Thurs. 7 to 9 beginning Feb. 3. New students admitted. Special fee \$20.

Geometrical problems, orthographic projections, lettering, architectural symbols. Residence design, working drawings, details of construction, studies of modern methods of framing, and use of building materials.

MECHANICAL DRAWING (I, II, 2 cr. each sem.)—G. L. Edick; Tues. and Thurs. 7 to 9 beginning Feb. 3. New students admitted. Special fee \$20.

Geometrical problems, orthographic projections, intersections and developments, lettering, and study of material symbols. Studies in machine shop practice, assembly and detail drawings, scale detail drawings from measured sketches by the student.

FREEHAND DRAWING AND SKETCHING (I, II, 2 cr.)—Walter G. Cadmus; Mon. and Wed. 5 to 7 beginning Feb. 2. Special fee \$15. (Sketching only, two hours a week—1 cr.—special fee \$10.)

A study of light and shadow, color and line. An intensive study of theory and harmony of color and composition from still life, and pictorial and outdoor sketching. The student may work with any medium such as pencil, colored pencil, charcoal, water colors, pastels, oils, etc. Each student will receive individual criticism. Open to both beginners and advanced students.

Advanced Undergraduate

LAYOUT AND APPLIED ART (IV, 2 cr.)—Paul Bissell; Tues. 5 to 7 beginning Feb. 3. \$14.

A combination discussion and laboratory course in the making of booklets, pamphlets, posters, etc., including art work, layout, lettering, typography and the use of photographs necessary in their production. Emphasis will be placed on the making of "roughs", "visuals", and "dummies", although advanced art work will be encouraged. The various methods of engraving and printing will be explained and demonstrated in class work. The class is designed to meet a growing need in the government for trained workers of this type and is for those who have some art ability and are willing to work on assignments at home between classes.

PHOTOGRAPHY

Advanced Undergraduate

BASIC PHOTOGRAPHY (III, IV, 2 cr.)—Carl H. Hanson and other specialists; fall, 1942-43.

DEPARTMENT OF OFFICE SKILLS

Departmental Committee

JAMES F. GRADY, A.B., Correspondence Counselor and Assistant Chief, Division of Training, Office of Personnel (Chairman)
HENRY A. DONOVAN, Assistant Chief, Bureau of Agricultural Chemistry and Engineering

CARL E. HERRICK, A.B., Assistant Chief, Division of Employment, Office of Personnel

JOHN S. LUCAS, Chief, Communications Division, Office of Plant and Operations

WILLYE A. SMITH, Office of Personnel

AUDITING PROCEDURE (II, 2 cr. each sem.)—Carey G. Cruikshank;
Wed. 5 to 7 beginning Feb. 4. Continuation of fall semester.
\$12.

This course is designed to assist audit clerks in their present and prospective positions and to enable government employees working in the lower grades as clerks, typists, etc., to fit themselves for more responsible and remunerative positions. It embraces explanations of, discussions on, and practice work with all types of government vouchers and related documents. A manual is used which outlines in detail all the various procedures. During the second semester, the course covers letters of authorization and travel authority; per diem computations and allowances; methods of travel; reimbursement vouchers; pay rolls; advertising vouchers; adjustment vouchers; application of statutes, regulations and Comptroller General's decisions to auditing; collections and deposits; preparation of replies to General Accounting Office exceptions and correspondence in connection with auditing.

PURCHASING PROCEDURE (II, 1 cr.)—Samuel A. Snyder; fall,
1942-43.

COMMUNICATIONS AND RECORDS MANAGEMENT (II, 2 cr.)—John
S. Lucas, William Muller, and James R. Roads; Tues. and
Fri. 5 to 7 beginning Feb. 3 and continuing for 15 sessions.
\$12.

Mail, files, and communications procedures. The course will embrace instruction and workshop practice in (1) communications, including mail handling, telegrams, messenger service; (2) records management, including planning of procedure in records units, subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material, folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment and filing materials.

ENGLISH FOR LETTERS AND REPORTS

PRACTICAL ENGLISH USAGE (II, 2 cr.)—Alfred D. Stefferud; Wed.
5 to 7 beginning Feb. 4. \$12.

This course will enable the student through practice to master the fundamentals of correct English. Troublesome problems of English usage, sentence structure, choice of words, style, and grammar, will be studied as aids to clear and forceful writing of letters, memoranda, and reports.

VOCABULARY BUILDING—Sallie M. Pease; Thurs. 5 to 7 beginning
Feb. 5. \$12.

A course designed to help writers and speakers to express their ideas clearly and attractively. It embraces, through use of the dictionary, word study and selection, diacritical markings, synonyms and antonyms, prefixes and suffixes, usage exercises, and other means of developing a broad and useful command of words.

GOVERNMENT LETTER WRITING (II, 2 cr.)—Florence P. Marks;
Tues. 5 to 7 beginning Sept. 30. \$12.

The writing of Government letters from the organization of subject matter to the language of the letter, paragraphing, construction of effective sentences, and correct usage. Vocabulary building. Methods for improving expression. Development and application of appraisal standards. Discussion of the problems involved in dictating and reviewing correspondence and supervising letter writers from the standpoint of the stenographer, dictator, reviewer, and supervisor.

WORKSHOP IN LETTER AND REPORT WRITING (II, 2 cr.)—James
F. Grady and Barbara H. Rawson; Mon. 5 to 7 beginning
Feb. 2. \$12.

The development of clear and forceful expression in reports, letters, and memoranda is the objective of this course. Although this is an advanced course in writing which presupposes a knowledge of the basic principles, particular emphasis will be placed upon methods of gaining increased skill in the application of the fundamentals of effective expression: planning and organizing material; using words appropriately; evidencing, through logical paragraphing and sentence structure, the proper sequence of ideas. This is a clinic course in which classroom discussion will be based upon the material written by members of the group.

SECRETARIAL PRACTICES

SECRETARIAL PRACTICES—George M. Terry; Tues. 5 to 7 beginning
Feb. 3. \$12.

Designed for secretaries and stenographers who seek guidance in developing their talents and abilities for broader governmental service in the secretarial field. This course will cover the basic essentials indispensable to Government secretaries and aid them in reaching definite objectives with special emphasis on relationships between employer and secretary. Among the topics covered

will be telephone technique, knowledge of office devices and their appropriate uses, elementary mailing and filing techniques, office decorum, interviews and getting a job, and meeting callers.

Prerequisite: Stenographic experience or consent of instructor.

ADVANCED SECRETARIAL PRACTICES—Alice Coffman; Tues. 5 to 7 beginning Feb. 10. \$12.

This course will emphasize the techniques of effective performance of the non-stenographic duties and responsibilities of the secretary; the personal qualities necessary for the private secretary; the amenities of the vocation; and the relation of the principles of secretarial work to office organization. Classroom discussions will be supplemented by actual secretarial practice.

Prerequisite: "Secretarial Practices" or equivalent.

SHORTHAND DEVELOPMENT

GREGG, 70 to 100 WORDS—Alice Coffman; Mon. and Wed. 5:15 to 6:15 beginning Feb. 2. \$12. (Two sections will be formed if registration warrants.)

This course is designed for those who desire a review of theory in Gregg shorthand with dictation from 70 to 100 words a minute. Special attention will be given to the acquisition of a large vocabulary of Gregg outlines. Dictation will be graded from business letters, the Congressional Record, and legal and technical matter relevant to the work in government offices.

GREGG, 100 to 130 WORDS—Clara E. Richter; Mon. and Wed. 5 to 6 beginning Feb. 2. \$12.

This speed, actual word count, is the equivalent of 100 to 150 words by the standard word count formerly used. This course is designed to develop speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed. Students who are primarily interested in dictation, such as stenotypists, may also enroll.

PITMAN, 70 to 100 WORDS—Dr. Louise C. Barry; Tues. and Thurs. 5 to 6 beginning Feb. 3. \$12.

A course designed for those who wish to review the principles of Pitmanic shorthand with dictation from 70 to 100 words per minute. Special emphasis will be placed on the acquisition of speed and accuracy by means of (1) the fundamental principles of phrasing, as determined by grammatical construction and Pitmanic theory; (2) the use of brief forms for constantly recurring and fundamental words; (3) the attainment of a stenographic vocabulary suitable for general business and governmental work; (4) the development of increased accuracy and precision in the formation of outlines to attain instant legibility.

PITMAN, 100 to 130 WORDS—Dr. Louise C. Barry; Fri. 5 to 7 beginning Feb. 6. \$12.

(Students who show ability to exceed the 130-word speed will be given ample opportunity.) The art and theory of phraseology in the acquisition of speed; the use of the ticks; the theory and practice of expert expedients including the principles of omission, fictitious primitives, alternatives and consecutives, and in general the technique and style of rapid Pitmanic shorthand. The dictation material will be the records of committee hearings. A conference and clinical meeting will be held two hours each week from 5 to 7 on Fridays, supplemented by practice exercises at times to be arranged convenient to the members of the class.

REPORTING 130 to 150 WORDS—Clara E. Richter; Mon. and Wed. 6 to 7 beginning Feb. 2. \$12.

The speed is based on actual word count and is the equivalent of 150 to 175, standard word count. This is a continuation of the 100 to 130 word class with special emphasis on reporting technique.

ADVANCED REPORTING, 150 WORDS AND UP—Clara E. Richter; Mon. and Wed. 6 to 7:30 beginning Feb. 2. \$12.

This class will be combined with the class in Reporting, 130 to 150 Words, for drill and speed dictation in technical vocabulary. From 7 to 7:30 the emphasis will be placed on dictation at 150 actual words a minute and up.

SHORTHAND IN SPANISH—Grace M. Bauer; fall, 1942-43.

ADVANCED SHORTHAND IN SPANISH—Grace M. Bauer; Tues. 5:30 to 7:30 beginning Feb. 10. \$12.

Dictation of business letters and commercial articles on Latin American subjects; reading of notes; incidental review of Spanish Gregg Shorthand Manual.

Prerequisite: "Shorthand in Spanish".

EXTENSION EDUCATION

Graduate and Advanced Undergraduate

Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

EXTENSION ORGANIZATION AND PROGRAM DETERMINATION (IV, V, 2 cr.)—Meredith C. Wilson and Barnard Joy; hours to be arranged, beginning Feb. 5. Room 5534 South Bldg. \$14.

An analytical review of the best procedures to be followed in developing State, county, and community programs of work, and outlining of plans of work looking to the orderly development of specific projects, including a discussion of the place of local leaders in extension teaching. The representative organizations of rural people are studied for the purpose of discovering points of contact and interest for cooperation in the conduct of extension work.

EXTENSION THESIS (V)—Meredith C. Wilson. Registration fee \$3. An opportunity will be afforded to qualified persons who desire to undertake a study of an extension problem and submit a thesis. The amount of credit, to be determined by a thesis committee, will be based upon the nature of the problem, amount of work, and quality of the thesis.

EXTENSION METHODS (IV, V, 2 cr.)—Meredith C. Wilson and Barnard Joy; 1942-43.

HOME ECONOMICS

Undergraduate

INTERIOR DECORATION (I, 1 cr.)—Harriet Garrels; Wed. 5 to 6 beginning Feb. 4. \$6.

A course for amateurs and homemakers. Consideration of backgrounds, color schemes, furniture, arrangement, selection, and other elements which enter into creating interiors of charm and good taste.

CLOTHING SELECTION (II, 2 cr.)—Vienna Curtiss; Wed. 5 to 7 beginning Feb. 4. \$12.

Selection of wearing apparel with relation to personality. Occasional lectures in consumer buying, based upon textile analysis. Students will bring apparel, pictures, and simple, original sketches for class discussion.

SPECIAL COURSES

MAN AND SOIL THROUGH THE AGES (V, 2 cr.)—Dr. Hellmut de Terra; hours to be arranged, beginning in April. Inquire at Graduate School Office. \$14.

Lectures, reading assignments, and seminar discussion. Topics to be covered are: A new outlook on human evolution; the earliest habitats of man; the primitive approach toward environment; Ice Age cycle and soil formation; how man came to live by the soil; origins of animal husbandry; agriculture and origin of civilization in the Near East; prehistoric agriculture in India and China, and the foundation of urban living; climate and agriculture in early history; the coming of man in the Americas; prehistoric life in the desert fringe of the Southwest; climatic changes and American agriculture; geographic factors in the rise and decline of early American civilizations; the meaning of history for our present-day life.

SPECIAL LIBRARY SERVICES (IV, V, 1½ cr.)—Linda H. Morley; Wed. and Thurs. 7:30 to 9:30, Feb. 18 to Mar. 19. Special fee \$10.

A series of ten lectures on special library information and reference service, in which definite forms of service will be analyzed in relation to the varying classes of clientele and organizations served. The methods and philosophy of information and reference service will be stressed, rather than publications, and service in association, government and corporation libraries will receive most consideration, although specialized departments of public and university libraries will also be considered.

THE CLASSICS (St. John's College Program)—Tues. 7:30 to 9:30 beginning Feb. 3. Limited to 25 students. Non-credit. Special fee \$15.

These seminars, offered in cooperation with St. John's College of Annapolis, will base their discussions on books selected from the list of classics used in the St. John's program.

SEMINAR I—Richard Scofield of St. John's faculty.

Especially recommended for those who have not been members of other St. John's seminars. The books discussed are not only chronologically at the beginning of any list of Western classics but contain

ideas vital to the whole structure of Western Civilization. The books: classics of Homer, Plato, Aeschylus, Hippocrates, Herodotus, Sophocles, Aristotle, Plato, Euripides, and Euclid.

SEMINAR II—Raymond Wilburn of St. John's faculty. Continuation of the two first-semester seminars. New students admitted.

The books to be discussed:

1. Ptolemy, *Almagest*;
2. Villon, *The Great Testament*;
3. Chaucer, *Canterbury Tales*: Prologue, Knight, Millere, Prioress;
4. Chaucer, *Canterbury Tales*: Wyf of Bath, Clerke, Frankeley;
- 5 and 6. Cervantes, *Don Quixote*, Part I;
7. Shakespeare, *Henry IV*, As You Like It;
8. Shakespeare, *Othello*, *Tempest*;
9. Erasmus, *In Praise of Folly*;
10. Descartes, *Discourses*, *Meditations*;
11. Rabelais, *Gargantua*, Book I;
12. Rabelais, *Pantagruel*, Books II and III;
13. Locke, *Essay Concerning Human Understanding*, Books I and II;
14. Spinoza, *Treatise on the Correction of the Understanding*;
15. Hume, *Selections*.

UTILITY ADMINISTRATION AND REGULATION

These courses are offered to meet the special needs of a large group of federal employees. For their convenience the classes will be held in buildings of the Federal Power Commission and the Securities and Exchange Commission, 18th and Pennsylvania Avenue, N. W.

Information about the technical content of the courses may be obtained from Dr. Fayette S. Warner. Call Branch 274, Federal Power Commission.

PUBLIC POWER (2 cr.)—Judson King, Dr. H. W. Blalock, and Dr. C. A. Duval; Tues. 7:30 to 9:30 beginning Feb. 3. \$14.

General review of the development and operations of the publicly owned electric utilities in America. Both historical and statistical analyses of the numerous problems of the publicly owned utilities, involving organization, financing, operations, rates, sales, costs, legal or political obstacles, and "yardsticks". The development and operations of the following publicly owned electric utilities: municipal, district, cooperative, State, and Federal.

WATER POWER ENGINEERING (3 cr.)—Kenneth W. Ross; Mon. and Wed. 5:30 to 7 for 18 weeks beginning Feb. 2. \$21.

A series of classroom exercises involving recitations, problem work, and lectures on the fundamentals of water power engineering and the important procedures necessary for their practical application. The subjects covered include precipitation, water losses, run off, stream flow, effects of storage, water power estimates, hydraulic turbines, and power plant arrangement. Application of fundamentals to development of river basins, and the characteristics governing the selection of dam and reservoir sites for various purposes.

Prerequisite for credit: Hydraulics.

ELECTRIC UTILITY ENGINEERING (2 cr. each sem.)—J. M. Morgan and C. E. Bennett; Tues. 7:30 to 9:30 beginning Feb. 3. Continuation of fall semester. \$14.

The fundamentals of electric utility engineering and their practical application to generating, transmitting, and distributing electric energy by electric utilities. Designed for engineers, engineering aids, lawyers, accountants and others who desire a broader understanding of the basic principles of electric utility engineering as applied to operating electric utilities.

The subjects covered are: A general description of production, transmission, and distribution plants of electric utility, including each of the units of the property and an explanation of its function; lectures and case studies in design and operation of electric generating stations, transmission lines and substations, and distribution substations, feeders, transformers, and services; discussions of practices followed by electric utilities in serving different classes of customers.

ELECTRIC AND GAS UTILITY RATES (2 cr.)—H. Zinder and W. E. Caine; Thurs. 7:30 to 9:30 beginning Feb. 4. \$14.

Principles and practice of rate design; customer and service classifications; engineering and economic factors in rates and rate contract forms and provisions; discussion of allocation of costs; problems in determination of rate discrimination; review of problems of rate base, operating expenses, depreciation and rate of return.

ORIGINAL COST ACCOUNTING FOR ELECTRIC AND GAS UTILITIES (3 cr. each sem.)—K. L. Smith and R. C. Rainwater; Mon. 7:30 to 10 beginning Feb. 2. Continuation of fall semester. \$21.**

Application of principles and procedures in accounting for utility plant of electric and gas utilities on the basis of original cost, including a brief review of the historical development leading up to the adoption by regulatory authorities of the basis of cost of property "to the person first devoting it to a public service", the

methods of determining original cost of utility plant when such property has passed through one or more ownerships, of the accounting treatment for write-ups and other adjustments arising from the establishment of original cost, of the accounting requirements of regulatory bodies relative to plant additions and retirements, of the principal features of "perpetual inventory" or continuing property record installations; and a thorough study of the problem of depreciation in connection with original cost accounting.

PUBLIC UTILITY FINANCE (2 cr.)—Dr. L. T. Fournier and George Otis Spencer; Tues. 7:30 to 9:30 beginning Feb. 3.* \$14.

Principles governing issuance of securities by public utility companies and by holding companies, including types and amounts of securities to be issued, refunding operations, debt retirement policies, equity financing, protective covenants of mortgage indentures, preferred stock voting and other protective provisions, standards in reorganization financing, and competitive bidding. Consideration also given to dividend depreciation policies, stock dividends, acquisition of system securities by tenders or otherwise, and to some reorganization problems under the Public Utility Holding Company Act of 1935.

PUBLIC UTILITY EVIDENCE (3 cr. each sem.)—Lambert McAllister and others; Wed. 7:30 to 10 beginning Feb. 4. Continuation of fall semester. \$21.**

Principles and methods used in planning electric and gas formal cases; in supervising the work of witnesses; in qualifying, examining and cross-examining witnesses; in using evidence and in the preparation of briefs; in conducting examinations of utility plants and operations; and in collecting and organizing data for the purpose of preparing and presenting exhibits on engineering, economic and legal aspects of formal cases.

PUBLIC UTILITY ACCOUNTING: ELECTRIC AND GAS UTILITIES (2 cr.)—R. F. Gates and C. A. Michel; Thurs. 7:30 to 9:30 beginning Feb. 5. \$14.

Designed to acquaint the student with the underlying principles of public utility accounting as embodied in uniform systems of accounts prescribed by state public service commissions and by the Federal Power Commission for electric and gas utilities. Study of the balance sheet, plant, income, revenue, and expense accounts of electric and gas utilities, as well as the regulations and instructions for keeping public utility accounts and preparing reports to regulatory bodies. Discussions of principles and solutions of problems with a view to giving the student an understanding of public utility accounting from the standpoint of the regulations under which public utility accounts are required to be kept.

MANUFACTURING INDUSTRIES AND THEIR USE OF ENERGY (2 cr.)—Dr. Fayette S. Warner and S. H. Thompson; Mon. 7:30 to 9:30 beginning Feb. 3. \$14.

This course is designed to give those who are interested in the operations of business a knowledge of the economics of manufacturing and the use of power and energy in production. Industries are analyzed to discover the nature and the causes of their growth, decline, shifts in location, seasonal variations in production, difficulties of production control, investment in plant, shifts in raw materials, changes in processes of production, competition between companies or with other industries, industrial location and the economic transportation for manufacture and distribution with regard to the conversion of raw materials into basic, semi-finished and finished products in several of the various basic extracting and manufacturing industries. The industries will include coal, petroleum, lumber and forest products, iron and steel, aluminum, copper, leather, rubber, clay products, textiles, meat packing and various food products.

* Note: One meeting each month will be a discussion session under the direction of Commissioner Robert E. Healy, Securities and Exchange Commission.

** Note: Once a month the Public Utility Evidence class meets with the Original Cost Accounting class (Mondays) under the general supervision of Commissioner Clyde L. Seavey, Federal Power Commission. Also, once a month the Original Cost Accounting class meets with the Public Utility Evidence class (Wednesdays) in a moot hearing or moot court under the general supervision of Commissioner John W. Scott, Federal Power Commission.

FACULTY

SECOND SEMESTER

(NOTE: This is not a complete faculty roster. It includes only those instructors who are offering courses during the second semester. It does not include instructors of courses given by other educational institutions and listed cooperatively in this catalog. Information about faculty members is necessarily brief and confined to that which is most significant for the courses taught.)

John J. Bachmann, C.P.A.; A.B., St. Thomas; M.S.C., Southeastern. Chief Accountant, Division of Audits, Commodity Exchange Administration. Taught in St. Thomas College, and American Institute of Commerce. (Public Administration)

N. G. Barbella, A.B., M.S., George Washington. Associate Biochemist, Bureau of Animal Industry. Taught in George Washington University. (Language Aids)

Louise C. Barry, B.L., J.D., California. Stenographer, Solicitor's Office. (Office Skills)

Grace Bauer, A.B., M.A., George Washington. Stenographer, Division of American Republics, Department of State. (Office Skills)

William R. Beattie, B.S., M.S., Ohio. Retired Senior Horticulturist, Bureau of Plant Industry. Assistant in Ohio State. (Biological Sciences)

Claudius E. Bennett, B.S. in E.E., Nebraska; M.S. in E.E., E.E., Illinois. In charge of Transmission Section, Bureau of Electrical Engineering, Federal Power Commission. Taught in Universities of Florida, North Carolina, and George Washington. (Utility Administration and Regulation)

Victor W. Bennett, A.B., Gettysburg; M.A., Pittsburgh; Ph.D., Washington. Associate Professor of Commerce, University of Maryland. (Public Administration)

Paul Bissell, B.S., Clemson. In Charge, Visual Information, Soil Conservation Service. (Engineering and Mechanical Arts)

Sidney F. Blake, A.B., M.A., Ph.D., Harvard. Senior Botanist, Bureau of Plant Industry. Formerly Professor of Botany, Stanford University. (Biological Sciences)

H. W. Blalock, A.B., Louisiana State University; M.A., Ph.D., University of Illinois; Consultant, Federal Power Commission; Commissioner, Department of Public Utilities, State of Arkansas, for four years; taught in University of Arkansas. (Utility Administration and Regulation)

David I. Blumenstock, B.S., Chicago; graduate study, California. Assistant Climatologist, Soil Conservation Service. Taught in University of California. (Physical Sciences)

Samuel S. Board, A.B., Yale; graduate study, Columbia. Chief, Division of Training, Office of Personnel. Lecturer, American University. (Public Administration)

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Ira T. Braunstein, LL.D., Royal University, Lemberg, Austria; graduate study, New York University. Clerk, Commodity Credit Corporation. (Language Aids)

James L. Buckley, LL.B., Georgetown. Assistant Director of Personnel, Department of Agriculture. (Public Administration)

Walter G. Cadmus, Jr. B.S. in Architectural Engineering, Kansas. Specifications Writer, Bureau of Agricultural Chemistry and Engineering. (Engineering and Mechanical Arts)

Walter E. Caine, B.S., Buffalo; M.B.A., Northwestern. Senior Rate Investigator, Federal Power Commission. (Utility Administration and Regulation)

Herbert O. Calvery, B.S., Greenville; A.B., M.S., Ph.D., Illinois. Guggenheim Fellow, Research in Europe. Senior Pharmacologist, Food and Drug Administration, Federal Security Agency. Taught in Johns Hopkins University and University of Michigan Medical School. (Physical Sciences)

E. P. Clark, M.S., Ph.D., Iowa. Senior Chemist, Bureau of Entomology and Plant Quarantine. Taught in University of Iowa. Research Chemist in Rockefeller Institute for Medical Research, Bureau of Standards, and University of Alberta. (Physical Sciences)

Leland B. Clark, B.S., California. Senior Mechanic, Radiation Research, Smithsonian Institution. Formerly Instructor of Electrical Engineering, University of California, and Physicist, San Francisco Research Laboratory. (Engineering and Mechanical Arts)

Alice A. Coffman, Graduate, Fort Madison Business College. Stenographer, Office of the Solicitor. (Office Skills)

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Joseph F. Daly, A.B., M.S., Catholic; Ph.D., Princeton. Instructor of Mathematics, Catholic University. (Mathematics and Statistics)

Raul d'Eca, M.A., Ph.D., George Washington. Associate in Portuguese, George Washington University. (Language Aids)

Raphael De Haro, A.B., North Texas State Teachers; LL.B., Dallas School of Law. Secretary, Office of the Vice President. (Language Aids)

W. Edwards Deming, B.S. in E.E., Wyoming; M.S., Colorado; Ph.D., Yale; summer courses with Fisher, Pearson, and Neyman. Mathematics Adviser, Bureau of the Census. Taught in Universities of Wyoming and Colorado, and Yale. Lecturer in Mathematics, National Bureau of Standards. (Mathematics and Statistics)

Hermann de Terra, Ph.D., Munich. Lecturer, New School of Social Research, New York City. Taught in University of Munich (Germany), and Yale University. Organized and directed two expeditions to Northern India with the support of the Carnegie Institution. (Special Courses)

Claiborne A. Duval, A.B., Louisiana State; M.A., Ph.D., Texas. Senior Economist, Division of Civilian Supply, Office of Production Management. Taught in University of Texas. (Utility Administration and Regulation)

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Richard L. Funkhouser, A.B., Dartmouth; M.A., Princeton. Secretary-Treasurer, American Statistical Association. Taught in Valley Ranch School for Boys and Amos Tuck School, Dartmouth College. (Mathematics and Statistics)

Harriet E. Garrels, A.B., M.A., George Washington. Art Supervisor, Public Schools, District of Columbia. Taught in Abbott Art School and Wilson Teachers College. (Home Economics)

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Harry B. Humphrey, B.S., Ph.D., Minnesota. Majors in modern languages and botany. Principal Pathologist, Bureau of Plant Industry; Editor-in-Chief, PHYTOPATHOLOGY. Taught in Stanford, Hopkins Marine Station, Washington State College, and Washington College of Music. Member, Cercle Francais, D. C. (Language Aids)

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Oswald Nielsen, Ph.B., Chicago; Ph.D., Minnesota; major in accounting. Senior Statistical Analyst, Office of Budget and Reports, Navy Department. Taught in University of Minnesota and American University. (Public Administration)

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James R. Roads, LL.B., National. Chief, Mail and Files Section, Farm Security Administration. (Office Skills)

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Olivia Russell, A.B., Barnard; M.A., Columbia; graduate study toward Ph.D., in Romance Languages, Columbia. Teacher of Spanish, Woodrow Wilson High School, District of Columbia. (Language Aids)

Mary Sabarth, educated in Germany. Special work in languages at University of Berlin. Taught in Robert College, Constantinople, Turkey; Barnard College, Columbia University; Wells College; and Fairmount Junior College. Traveled extensively in Europe, Asia, and Africa. (Language Aids)

George Michael Saharov, A.B., California at Los Angeles; graduate study, California, American and Harvard; graduate of Classical Gymnasium, Tula, Russia; student, Imperial University, Moscow, Russia. Associate Economist, Interstate Commerce Commission. Taught in University of Southern California and private instruction according to Russian Gymnasium program, Shanghai, China. (Language Aids)

Manuel de J. Sainz, B.S., Matanzas (Cuba); Doctor of Civil Law and Doctor of Public Law, Havana. Instructor in Latin American Institute. Formerly Chancellor of Cuban Embassy. Taught in University of Havana. (Language Aids)

Robert B. Schwenger, A.B., Wisconsin; Fellow of the Graduate Institute of International Studies, Geneva, Switzerland; Fellow of University of Chicago. Foreign Trade Adviser, Office of Foreign Agricultural Relations. (Economics and Social Sciences)

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Alfred D. Stefferud, A.B., St. Olaf; graduate study, University of Iowa, American Academy in Rome, and Universities of Berlin and Vienna. Senior Information Specialist, Bureau of Agricultural Economics. Formerly foreign correspondent in Berlin and Vienna, and foreign news editor in New York, both for Associated Press. (Office Skills)

Alexander Sturges, B.S., Oregon Agricultural. Senior Statistician, Department of Labor. (Mathematics and Statistics)

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Fayette S. Warner, C.E., Rensselaer Polytechnic Institute; M.B.A., Ph.D., Pennsylvania. Senior Engineer, Federal Power Commission. Taught in University of Pennsylvania. (Utility Administration and Regulation)

Max J. Wasserman, A.B., Cornell; M.A., Illinois; Dr. es Sc. Econ., University of Lyons, France. Principal Economist, European Division, Economic Warfare Board. Taught in Universities of Illinois, Chicago, and Lyons (France). Fellow social science Research Council in France, 1927-29. (Economics and Social Sciences)

Michael T. Wermel, B.S., New York; M.S., Ph.D., Columbia. Senior Economist, Social Security Board. Formerly Instructor and Assistant Professor of Economics, Brooklyn College. (Economics and Social Sciences)

J. B. Westcott, Ph.D., Harvard. Fiscal Accountant, Office of Budget and Finance. Taught in University of Pennsylvania. (Public Administration)

Sidney W. Wilcox, B.L., California. Chief Statistician, Department of Labor. Formerly Head, Department of Economics, University of Nevada, and Head, Department of Statistics, University of Pittsburgh. Also taught in Universities of California and Chicago. (Mathematics and Statistics)

Meredith C. Wilson, B.S., New York State College of Agriculture, Cornell. Chief, Division of Field Studies and Training, Extension Service. Taught in summer session courses at Universities of Wisconsin, Louisiana, Maryland, Purdue, Arkansas, State Agricultural College of Colorado, Virginia Polytechnic Institute. (Extension Education)

DeWitt C. Wing, Senior Information Specialist, Office of Information. (Language Aids)

Harry J. Winslow, B.S., M.S., Minnesota. Senior Statistician, National Resources Planning Board. Taught in Evansville College and U. S. Naval Academy. (Mathematics and Statistics)

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Leon O. Wolcott, Ph.B., Brown; LL.B., New York Law School. Special Assistant, Surplus Marketing Administration. Formerly Assistant to Secretary Henry A. Wallace. Co-author with John M. Gaus, *Public Administration and the Department of Agriculture*. (Public Administration)

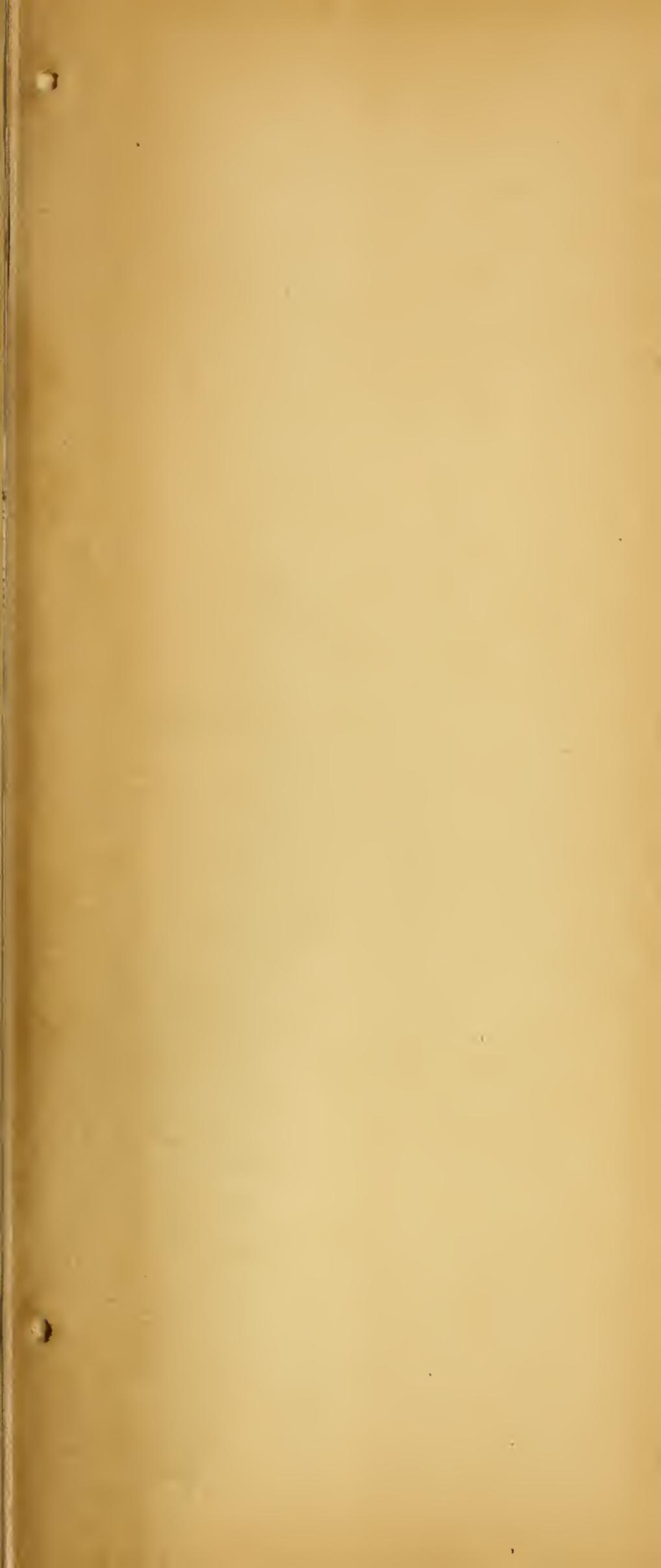
Charles L. Wright, Jr., B.S., Massachusetts Institute of Technology. Naval Architect, Navy Department. (Engineering and Mechanical Arts)

Hanina Zinder, B.S. in E.E., Carnegie Institute of Technology; M.B.A., Northwestern. Chief, Division of Rates and Research, Federal Power Commission. Taught in Northwestern University. (Public Administration and Regulation)

David Ziskind, Ph.B., J.D., Chicago; M.A., Southern California; Ph.D., Johns Hopkins. Senior Examiner, Department of Labor. Taught in Southwestern University, Los Angeles. Formerly Labor Adviser in N.R.A. and Resettlement Administration. (Economics and Social Sciences)

MAIL REGISTRATION

Persons who desire to register by mail will be sent a mail registration form upon request.





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